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a manual for

Hospital Central Medical *and* Surgical Supply Services

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

This document is the fourth in a series of publications concerned with Hospital Central Medical and Surgical Supply Services, prepared by the Division of Hospital and Medical Facilities. Additional volumes will appear at intervals.

Earlier publications issued in this series include:

"Hospital Central Services: A Survey of Current Literature," Public Health Service Publication No. 980-C-8. 25 cents.

"A Study of Hospital Central Medical and Surgical Supply Services," Public Health Service Publication No. 980-C-10. 30 cents.

"Administrative Aspects of Hospital Central Medical and Surgical Supply Services," Public Health Service Publication No. 980-C-12. 30 cents.

The above documents may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. Free single copies are available from the Division of Hospital and Medical Facilities, Public Health Service, U.S. Department of Health, Education, and Welfare, Washington, D.C., 20201.

a manual for

Hospital Central Medical *and* Surgical Supply Services

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
Division of Hospital and Medical Facilities
Washington, D.C. 20201

Public Health Service Publication No. 930-C-13
May 1966

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 70 cents

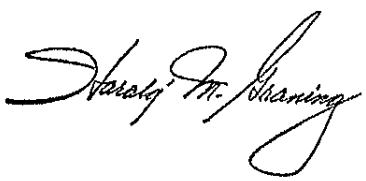
FOREWORD

This manual was prepared in response to a growing awareness of the need for procedural guidelines for the operation of Central Medical and Surgical Supply Services (CMSSS). A recent Public Health Service study revealed a lack of uniformity in functions and procedures of this service in a sampling of general hospitals.

Both the supervisor and the personnel of the CMSSS will find this publication a ready reference for day-to-day activities. The author has been very specific and detailed in her treatment of material, and the language has been chosen with particular regard for a special audience: the workers in CMSSS departments of hospitals. For the same reason, lists of instruments and the sample index of supplies and equipment, which ordinarily would be placed in an appendix, are presented in the text so that all material used together will be found together. This will facilitate its use in an active program of inservice education for CMSSS personnel.

As a special service, the illustrations (along with their identification) of treatment trays and sets presented in chapter VI will be available on 5- by 8-inch cards for separate purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402. Such cards may be used in a visible index file, leaving the manual intact for ready reference in the department.

Mrs. Marie M. Lech, R.N., M.A., Hospital Nurse Consultant of this Division, was project director for this publication. A major part of the work involved in developing and writing this manual was performed by Sister M. Diane, S.S.J., R.N., Nurse Consultant, Sisters of St. Joseph, Nazareth, Michigan.



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ACKNOWLEDGMENTS

Appreciation is expressed to the following individuals and groups for assistance in the preparation of this manual:

The National Association of Hospital Central Service Personnel for providing some of the preliminary information on this subject;

The following hospitals and organizations, who submitted lists and contents of treatment trays and sets, which were of invaluable assistance in the preparation of the trays illustrated:

Alexian Brothers Hospital—St. Louis, Mo.
Borgess Hospital—Kalamazoo, Mich.
Charlotte Memorial Hospital—Charlotte, N.C.
Doctors Hospital—San Diego, Calif.
El Camino Hospital—Mountain View, Calif.
Georgetown University Hospital—Washington, D.C.
Little Company of Mary Hospital—Evergreen Park, Ill.
Medical Service School—Gunter Air Force Base, Ala.
Montefiore Hospital—Long Island, N.Y.
Pittsfield General Hospital—Pittsfield, Mass.
Presbyterian Intercommunity Hospital—Whittier, Calif.
St. Francis Hospital—Wichita, Kans.
St. John Hospital—Detroit, Mich.

Miss Helen Leveille, Operating Room Supervisor, St. John Hospital, Detroit, Mich., for the itemized lists of instruments for surgical procedures;

John R. McGibony, M.D., former Chief of Intramural Research; Arthur E. Rikli, M.D., Assistant Chief for Programs; and Miss Anita Reichert, Assistant Information Officer, all of the Division of Hospital and Medical Facilities, for staff assistance;

Mr. Bert Emanuele for photographs which were taken at St. John Hospital, Detroit, Mich.; and

The many individuals who reviewed the preliminary draft and made valuable suggestions. They included hospital administrators, central service supervisors, nurses, pharmacists, environmental engineers, industry representatives, and other health specialists.

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Chapter I

GENERAL CONSIDERATIONS

Introduction

The Central Medical and Surgical Supply Service (CMSSS) has finally come into its own. For years it was the stepchild of the surgical suite as the dressing room where the ladies' auxiliary met to fold sponges and to make bandages. In the years following World War II, the need emerged for Central Medical and Surgical Supply Services in hospitals. These services grew very rapidly but many were devoid of sound planning and organization. Sterilization of supplies and equipment was the primary responsibility, but in later years other functions were delegated to this service.

For the past decade there has been an increasing interest on the part of individuals and organized groups to raise the standards of the CMSSS to equal those that have been established for the surgical suite. However, not all central service supervisors have had the opportunity to participate in laying the foundation on which this service department was built. Basically, its objective is to provide service to improve patient care and to maintain the high standards that have been set by hospital, nursing, and related associations. It also assists in discharging the responsibility of the hospital administration to protect personnel from infection and injury by providing a safe environment and continuous inservice programs.

Each supervisor should know the requirements and minimum operational standards as established by the State licensing agency. Knowledge of the standards is not sufficient, however. Members of the hospital team must do all that can be done to see that these standards are met to improve patient care and to establish a safe environment for patients and personnel. A guide, such as a procedures manual with specific directions for rendering safe supplies and equipment, will help accomplish this objective. Uniformity of procedures based on solid scientific principles should result in improved patient care.

The physical layout of the hospital, the scope of services and the available facilities often are the determining factors in routine procedures. A differentiation should be made between a principle and a practice. It is necessary, also, to be aware of all aspects of particular agents used in the various procedures in the processing of supplies, i.e., the potency, effectiveness, disadvantages, limitations, and mode of application in each specific procedure.

It is hoped that this manual will serve as a guide to those procedures normally performed in the CMSSS. Basically, these procedures include the various steps of processing supplies and equipment, namely: receiving, sorting, cleaning, disinfecting, inspecting, assembling, testing, packaging, labeling, sterilizing, dating, storing, controlling inventory, and issuing. Effective techniques in all procedures, especially sterilization, are preeminent in preventing hospital cross-infection. Standardization of procedures will also aid in the improvement of patient care and lead to greater economy by eliminating capital equipment in specialty areas and training nonprofessional personnel to work effectively in this service department.

If the basic principles of asepsis and antisepsis are understood by all employed in the department, there will be little danger of cross-infection, as asepsis concerns people more than it concerns supplies and equipment.

Because of the overriding importance of uniform procedures, this publication has been de-

signed as a procedures manual. It is intended as a guide to the proper techniques to be used in carrying out each procedure. Since not all procedures are used in every hospital, those applicable will need to be selected by the persons responsible for formulating a specific hospital's procedures manual. Furthermore, when a choice of methods is possible for a certain function, the various procedures are described and the advantages and disadvantages of each are noted. Those most appropriate may be utilized. At times, also, variables are indicated to provide additional flexibility in adapting the manual to the needs of the individual hospital.

A word on terminology may be in order at this point. Although the exact title of this service may vary from hospital to hospital, the most appropriate title is "Central Medical and Surgical Supply Service." Frequently, however, this is shortened to "Central Service." When "department" or "service" is used without a modifier throughout this publication, the Central Medical and Surgical Supply Service is meant. In some hospitals it will be a separate department; in others it will be part of a larger organizational unit.

Purpose of the Department

Basically the primary purpose of the CMSSS is just what the name implies—service. This service can be provided to its fullest capacity if each individual in the department is made aware of the importance of her role on the hospital team. In like manner each supervisor must instill in the personnel a recognition of the important role the department has in the maintenance of good patient care. The department has frequently been called the hub around which other sections of the hospital revolve, resulting in a constant flow of service throughout the entire organization. This can be possible only when the need for such service is recognized. Each must feel she has a contribution to make.

The various procedures that are carried out in the CMSSS reflect the basic overall objective of the department, namely, that of contributing to improved patient care through providing supplies and equipment by more efficient means and greater economy. This improved patient care must be considered foremost in all procedures. However, more efficient means are now available for processing supplies and equipment as a result of many years of research and experimentation by recognized leaders in the hospital field. We are living in an era of constant change, of chronic dissatisfaction with the present method of doing things. There has been a steady effort to improve procedures, in which most of us sooner or later become involved. Changes do not necessarily mean improvement but they do bear investigation. A procedure may be performed the same way for five years, mainly because "it has always been done this way." Nine times out of ten, there may be a better way of doing it today.

Greater economy is realized by the pooling of resources. These resources include expensive capital equipment and supplies in the specialty areas, as well as the personnel processing supplies and equipment in these areas.

Another purpose of the department is that of the standardization of established techniques. By adapting standards that have been approved by recognized authorities for the processing of supplies and equipment, the department will be achieving its main purpose, that of providing improved patient care. Better nursing care and greater patient satisfaction may be accomplished by carefully analyzing the methods of processing the supplies and equipment issued from the department to see whether or not they are meeting the needs for which they were intended. This may be done by a careful evaluation of the objectives of the department.

OBJECTIVES

The specific objectives of this service department include:

- To provide all necessary supplies and equipment for patient care to all nursing units and specialty areas.
- To maintain and supply special items and equipment that may be necessary in the care of the patient.
- To promote better care by providing prompt and accurate service to the medical and nursing staff.
- To provide supplies of sterile linen packs, basins, and instruments that may be requested in the specialty areas.
- To maintain an accurate record of the effectiveness of the various processes of cleaning, disinfecting, and sterilization.

- To strive for uniformity and simplicity in the trays and sets that the department maintains for the care of the patient.
- To provide service to the patient by maintaining high quality supplies and equipment that are issued from the department.
- To contribute to the educational programs within the department, the hospital, and the community.
- To maintain an accurate inventory of supplies and equipment.
- To reduce total cost of the department by cost analysis of personnel, supplies, and equipment.

The main objective of the procedures manual is to provide well-defined written instructions for the processing of supplies and equipment, which are always available as a guide. This manual must be subject to continuing review to meet changing conditions. What has been set forth as an established procedure may change in a year from now as a result of the progress being made in the area of CMSSS.

FUNCTIONS

The department's functions evolve from its objectives. Generally, it should perform the following functions:

- Process, maintain, and dispense supplies and equipment required by medical, nursing, or paramedical personnel in designated departments for the care, diagnosis, or treatment of patients.
- Provide modern equipment maintained in optimum working condition and utilize best known methods and techniques for the processing of materials.
- Develop processing and supply control methods which will provide supplies and equipment most efficiently and economically.
- Provide effective training programs and competent supervision to assure high standards of performance for CMSSS personnel.
- Participate in inservice education programs for all hospital personnel.
- Maintain representation on nursing care procedures, standardization, and infections control committees.
- Participate in supply and equipment research in an effort to provide the most suitable information available to nursing, paramedical, and medical groups.

The Procedures Manual

PURPOSE

A procedures manual has a threefold purpose: (1) a teaching tool for the supervisor in the orientation of the new employee; (2) a guide for routine procedures for the employee; and (3) a reference for all employees for the occasional procedure.

A manual is essential to the effective operation of a department. The contents should be so arranged and the terminology so clear that it can be easily understood by all employees in the department. Because of the varied procedures and the complexity of the equipment used, it is almost an impossibility for the general employee to perform all types of procedures without the help of visual aids or a departmental manual. Also, it is impossible for the most efficient supervisor, with her multitude of responsibilities in the administrative procedures and hospital policies, to remember all the details of a particular procedure or the placement of a specific item on a tray.

As this manual is basically devoted to procedures, no specific reference is made to the organization of the department, planning of facilities, or types of equipment used.

PRINCIPLES

Before proceeding further, let us define the word procedure. Webster defines it in three ways: (1) a particular way of accomplishing something; (2) a series of steps followed in a definite order; and (3) a traditional or established way of doing things. Sometimes it appears that tradition has played an unduly important part in most of our procedures.

A principle is the basis upon which the correct way of performing a function is determined. Thus, a reference to the principles of procedures necessarily leads to the right way of doing something. An example of this may be applied to the principles of sterilization. Placing an article in the sterilizer and turning on the steam does not necessarily mean that the article is sterile when it is removed from the sterilizer. The principles or laws of sterilization must be applied in the procedure, i.e., the article would have to possess the properties that could be penetrated by steam; it would have to be free from soil, permitting surface contact of all parts to the steam; and the necessary time and temperature must be allotted to permit positive sterilization.

All too frequently principles are not given due consideration. The supplies thus processed may not necessarily be safe for redistribution. The danger or possibility of cross-infection is a continuing threat.

The importance of the practical application of all basic principles in the processing of supplies and equipment cannot be overemphasized. There are basic principles which underlie every procedure performed within the department. We are all aware of the fact that the mere washing of an item does not make it clean. The principles of proper cleansing must be put into effect: (1) removal of gross soil, (2) appropriate cleansing agent in the right amount, (3) the correct temperature of the water, and (4) the proper drying technique. All these contribute to the end result.

PRACTICES

It is essential that practices coincide with the established principles in the processing of supplies. A careful review of all present practices will reveal that many of them result from tradition and have little or no relation to an established principle. Many practices have an insidious way of coming into the department, sometimes because of the need for improvising during a time of shortage of a basic item, or because of the weakness of human nature to take the easy way out. Practices must be carefully analyzed from time to time to maintain the principles which apply to the proper processing of supplies and equipment.

Another reason for reviewing and, if necessary, revising current practices is to insure the application of safety measures to personnel who process supplies. Although one is acutely aware of the danger of cross-infection between patients, the same concern should be shown for personnel in the processing of supplies that have been used by patients.

Terminology

One of the biggest problems today is the lack of effective communications. Getting the other person to understand exactly what is meant can be very difficult at times. This applies to the written word as well as to the spoken. Our present Tower-of-Babel situation in the hospital field is the result of many circumstances. The great influx of people from other countries who work in hospitals may be one factor. Another may be the migration of personnel to the various sections of our country and the different interpretation given to the same word in different localities as well as within and without the hospital. Another factor that cannot be disregarded is the connotation that the younger generation has given to the most simple terms. Research, especially the area of medical science where new procedures and techniques are established for the improvement of patient care, also has made many additions to the already complex terminology of our era.

One word that is found quite frequently in the literature regarding the CMSSS today is "decontamination." One reads about decontamination areas and decontamination procedures. Webster presents two definitions of "contaminate," which is the root of the term decontamination: (1) to soil, stain, or infect by contact or association; (2) to make unfit by introduction of unwholesome or undesirable elements. To illustrate varying usage of these terms, here are three given situations:

- The supervisor of the surgical suite returns a set of instruments to the department with a note, "contaminated, tray opened but not used."
- The supervisor of the orthopedic department sends a splint to the department and requests that it be decontaminated.
- The supervisor of the pediatric department sends a bundle of supplies securely wrapped and clearly labeled, "CONTAMINATED."

Try to visualize the confusion of a new employee as she observes the different methods by which the three contaminated articles were processed. The instruments were washed, inspected, wrapped, and sterilized. The splints were washed in a detergent solution and returned to the orthopedic department. The bundle that was received from the pediatric department was put in the sterilizer before the supplies within the pack could be processed individually.

Above are three distinct methods of handling so-called contaminated equipment. One may be aware that all the articles were not contaminated in the same aspect, and in all three situations the term was correctly used according to definition, but in the Central Medical and Surgical Supply Service there are different connotations of the word.

In regard to contamination alone, one would think that it would be much more logical to say that in the first situation described the instruments

were *nonsterile.* The instruments were contaminated in the degree that they could not be used again for a sterile surgical procedure. In the second situation the splint had been *used* and was therefore undesirable for use for the next patient in the same way that the furniture in the room of a former patient would be undesirable until it was washed and made presentable for the next patient. The third situation represents a graver problem. The bundle marked "contaminated" from the pediatric department contained supplies that had been used by a patient who had a contagious disease. The articles were unfit for anyone to touch because of the danger they represented not only to the next patient who may be using them but also to the personnel who would process them.

Another difficulty encountered in regard to terminology is the names that are given to specific equipment. For example, a drainage pump may be referred to by the name of the company that manufactures it, the inventor of the first suction siphonage apparatus, or the body cavity from which the fluid is withdrawn. The use of descriptive names rather than the term commonly used would represent an advancement in accepted terminology. Oral, gastric, or thoracic suction machines denote three distinct drainage pumps.

Another problem in communication lies in the use of abbreviations. New hospital employees must find it a challenging feat when they are asked to return an L.P. tray to the O.R. and to give it to the L.P.N. It is quite an experience to learn that the O.R. means operating room, and the L.P.N. is the Licensed Practical Nurse in charge of receiving supplies, and the L.P. tray is really a spinal tray, with the initials indicating lumbar puncture.

To simplify the use of the procedures manual, words that will be used frequently are defined in the glossary that follows.

Glossary of Terms

Antiseptic: Any chemical agent that is usually applied to living tissue and which inhibits the growth of microorganisms without necessarily destroying them.

Aqueous solution: A liquid in which a chemical is dissolved in water.

Aseptic: Sterile, free from any living microorganisms.

Aseptic technique: Performance characterized by precautions for constant exclusion of microorganisms.

Autoclave: A sterilizing apparatus that uses saturated steam under pressure.

Bacteria: One category of microorganisms. This is the type of microorganism which is of greatest concern to hospital personnel because it is difficult to destroy and produces many different diseases.

Bagged: Method of enclosing supplies and equipment. This may be done by plastic or paper to prevent spread of infection or to maintain sterility.

Capital equipment: Expensive items that have an investment value such as sterilizer, water still, and some mechanical cleaning apparatus.

Communicable disease organism: A pathogenic microorganism which is readily transmitted from person to person by direct or indirect contact.

Contamination: Soiling with microorganisms or other harmful agents.

Detergent: A cleaning agent which facilitates removal of grease or soil. A suitable detergent must be selected; it must clean but not injure the surface of the article.

Diagnostic procedure: The method or manner of determining the presence, nature or cause of a disease.

Disinfectant: Any chemical agent, used on inanimate materials, which inhibits or destroys most microorganisms.

Ethylene oxide gas sterilizer: An apparatus using gaseous ethylene oxide, with or without added inert gas, as the sterilizing agent.

Equipment: Items of durable nature such as instruments and suction apparatus.

General stores: The facility of the hospital which stores in bulk form all supplies and equipment required within the hospital.

Germ: A microscopic or submicroscopic organism capable of producing disease.

Heat resistant: Not affected by heat.

Heat sensitive: Will be affected or destroyed by heat.

Hemostat: A clamp forceps to control the flow of blood.

High-vacuum steam sterilizer: A pressure apparatus, employing saturated steam as the sterilizing agent, which operates on the principle by which air is removed from the chamber with the aid of a vacuum pump or other mechanical device.

Infection: Invasion of human body tissues by pathogenic microorganisms.

Microorganisms: Organisms visible only with the aid of a microscope.

Moisture sensitive: Will be affected or destroyed by excessive moisture.

Pathogenic microorganism: A microorganism which produces disease.

Process: A series of procedures designed to prepare supplies and equipment for use in rendering patient care.

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Pyrogen: Fever-producing bacteria that may be found in water which is not freshly distilled.

Sanitization: A process whereby microorganisms present on an object are reduced in number to a level considered safe for human use.

Sanitizer: An apparatus employing a sanitizing agent such as hot water, steam, or chemicals.

Solutions:

External: Sterile liquids that may be used as irrigation or cleansing agent.

Parenteral: Sterile liquids that are administered internally. Commonly referred to as intravenous solutions.

Spores: Certain microorganisms which usually form a thick cell wall enabling them to survive in adverse environments.

Sterile: Free from all microorganisms.

Sterilizer: Apparatus using saturated steam *under pressure,* ethylene oxide, or dry heat as the sterilizing agent. These include gravity and mechanical types

Supplies: Items ordinarily consumed by use in rendering patient care. However, such items as needles, glassware and linen are also classified as supplies.

Thumb forceps: Pincer-like instrument with smooth tip to grasp objects.

Tissue forceps: Pincer-like instrument with teeth to grasp tissue.

Ultrasonic washer: An apparatus in which the cleaning of equipment, principally instruments, is accomplished by the compressional force of the ultra-sound waves

Washer: An apparatus in which glassware, instruments, utensils, and other items are cleaned.

Washer-Sterilizer: An apparatus in which instruments and utensils are washed and then sterilized, employing saturated steam under pressure.

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Chapter II

SCOPE OF SERVICES, SUPPLIES AND EQUIPMENT

The Central Medical and Surgical Supply Service (CMSSS) is the department responsible for providing supplies and equipment required by all other departments that render patient care. It is the hospital department that renders service by collecting, receiving, processing, storing, issuing, and distributing supplies and equipment used in the care and treatment of patients. This department serves the entire hospital including related outpatient services. The scope of the services performed by this department, however, will depend on the individual hospital.

The supplies and equipment provided include dressings, rubber goods, parenteral solutions and administration sets, external solutions, needles, syringes, instruments, thermometers, treatment trays and sets, utensils, sterile linen packs, portable and miscellaneous equipment. Most hospitals purchase parenteral solutions. Thus, CMSSS should prepare only distilled water and normal saline for external use. Any other solution should be prepared by legally qualified personnel. In some hospitals, orthopedic and inhalation therapy equipment may also be provided by this department.

Departments To Be Serviced

NURSING UNITS

All nursing units within the hospital that administer general or special nursing care to the patients are serviced by the CMSSS. This service includes the processing of all basic supplies and equipment that may be required during the patient's period of hospitalization. It may also include those supplies required for home care that may be given on discharge in hospitals that make such follow-up provisions.

SURGICAL SUITE

The department may provide the surgical suite with the following basic items:

- Dressings
- Parenteral solutions
- Administration sets
- Gloves
- External solutions
- Special trays
- Needles
- Syringes
- Miscellaneous supplies and equipment, such as armboards and drains

The department may also provide the following special sterile items and anesthesia supplies if needed.

- Linen
- Linen packs
- Basin sets
- Basic instrument sets
- Air ways
- Suction catheters

LABOR-DELIVERY UNIT

The department may process and supply all items that may be required by the patient from the time she is admitted into the labor room until she has delivered.

Basic items:

- Examination equipment and supplies
- Preparation equipment and supplies
- Dressings
- Administration sets

Basic items—Continued
- External solutions
- Needles
- Gloves
- Parenteral solutions
- Syringes
- Special trays

Special sterile items:
- Linen packs
- Basin sets
- Basic delivery instruments
- Special delivery instruments

NURSERY

The department may process and supply all items and equipment necessary for the individual care of all infants in the nursery. This includes the equipment used in the care of the premature infant and those who may require special treatment.

Basic items and equipment:
- Bathing sets
- Sterile linen
- Thermometers
- Examination equipment

Special equipment and service:
- Special trays, such as exchange transfusion, resuscitation, and circumcision
- Processing of nursery equipment, such as incubators and resuscitators

OUTPATIENT DEPARTMENT

The outpatient department includes the emergency room and is serviced with all supplies and equipment necessary in the treatment and care of all patients in this area. If hospital policy provides supplies, these may include those necessary for the patient to continue his care at home until the next visit to the department.

Basic items and equipment:
- Examination equipment
- Diagnostic procedure trays
- Rubber goods, such as gloves and catheters
- Treatment trays and sets
- Dressings
- Miscellaneous supplies

RADIOLOGY

All supplies and equipment for the diagnostic procedures and the care of the patient while in the radiology department are supplied by the CMSSS. Special procedure trays are considered as basic equipment when supplied to this specialty department.

Basic supplies and equipment:
- Diagnostic procedure trays and sets
- Needles and syringes
- Inhalation equipment
- Rubber goods, such as gloves and rectal tubes
- Miscellaneous supplies

PHARMACY

Solutions and supplies such as needles and syringes required for preparation of drugs are provided to the pharmacy.

CLINICAL LABORATORY

The service to be provided to the clinical laboratory by the CMSSS has been a subject of much discussion. Each hospital will have to decide whether or not to wash and sterilize all equipment, including laboratory glassware. Among other things it depends on funds available for capital equipment since duplication of such equipment would be needed to make provision for the processing of laboratory supplies. However, due to the high degree of contamination, it is advisable to provide a sterilizer for the laboratory.

If disposable supplies are used, each hospital should decide whether or not this department shall be provided with supplies from the CMSSS or receive the supplies directly from general stores.

Basic supplies:
- Needles and syringes
- Dressings
- Rubber goods

RESEARCH DEPARTMENT

The extent of service that is provided to this specialty area will depend on the amount and type of research that is carried on in the hospital. The supplies and equipment that would ordinarily be provided would include the following:
- Linen packs for animal surgery
- Instrument sets
- Gloves
- Dressings
- Solutions
- Basin sets
- Needles and syringes
- Miscellaneous

Supplies and Equipment To Be Provided

DRESSINGS

The term "dressings" is a broad one. It may apply to any covering regardless of style, size, texture, weave, or material to cover, support, or protect a wound which may be surgical or traumatic. Dressings may be sterile or nonsterile. They may be classified as follows:

- Absorbent—gauze, cotton, cellulose, paper, cloth, wool, or sponge
- Antiseptic—gauze or cotton permeated with antiseptic solution
- Fixed—dressing permeated with starch, soda, or plaster
- Occlusive—an adherent dressing that seals the area around the wound

NEEDLES AND SYRINGES

These include both disposable and reusable types:

- Needles
  - Hypodermic
  - Intravenous
  - Spinal
  - Miscellaneous
- Syringes
  - Standard
  - Special

RUBBER GOODS

Includes all rubber supplies and equipment that may be required for patient care.

- Gloves
- Catheters
- Rubber sheeting
- Tubes and tubing
- Hot water bottles
- Ice collars
- Bulb syringes
- Special equipment

SOLUTIONS

Includes all special solutions that may be obtained from commercial firms, as well as solutions that are prepared in the department for general hospital use:

- Parenteral (intravenous)
- External (irrigating)

ADMINISTRATION SETS

These include all sets that are used to administer fluids to the patient:

- Blood transfusion
- Intravenous
- Hypodermoclysis
- Miscellaneous

INSTRUMENTS

All instruments on the nursing units and specialty areas such as surgical suite, labor and delivery room, and outpatient department may be serviced by this department. This would include the entire processing of the instruments, such as washing, drying, assembling, packaging, sterilizing, storing, and distributing. As an alternate the instruments could be assembled in the surgical suite or the delivery room, and sterilized in the department. Again, each procedure should be planned according to the needs of each individual hospital and the existing facilities.

STERILE LINEN

This includes all material processed for sterile usage:

- Individual items for patient care units
- Linen packs
  - (a) Surgical
  - (b) Delivery
  - (c) Nursery
- Special packs

TRAYS AND SETS

Special trays and sets are processed to provide treatment or for diagnostic procedures.

THERMOMETERS

This department shall provide and process thermometers for patient use.

UTENSILS

Included are:

- Patients' bedside utensils
- All other, i.e., solution basin, graduates, and the like

PORTABLE EQUIPMENT

The maintenance of all portable equipment, which would include all mechanical and electrical

equipment for patient care, should be the responsibility of this department. After being processed, the equipment should be stored in the department.

ORTHOPEDIC EQUIPMENT

If the individual hospital has an orthopedic unit where this equipment is stored, then the CMSSS should assume the responsibility for processing orthopedic equipment.

INHALATION THERAPY EQUIPMENT

If the hospital has an inhalation therapy department supervised by an inhalation therapist, the CMSSS would still bear the responsibility of providing the accessories and processing the equipment.

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Chapter III

COLLECTING AND RECEIVING

General Considerations

For many years the hospital surgical suite has assumed the responsibility for hospital infections. The popular assumption was that the source of infection originated at the time of operation and was probably caused by a break in aseptic technique. Today other patient care areas are sharing the responsibility. The medical and nursing professions are now aware that the patient, wherever he is, may be the greatest source of infection by shedding pathogenic microorganisms on articles with which he comes in contact. These articles, which include the patient's clothing, bedding, and utensils, are carriers for the spread of disease. A concentrated effort must be made to control any possibility of the spread of infection from patient to patient, from patient to personnel, or from personnel to patient. This method of control begins with the first step in the processing of reusable supplies and equipment.

Collecting

An appropriate collecting method contributes to a safe and efficient procedure in the processing of equipment. A specific area on the nursing units, equipped with containers with disposable liners, is assigned for the collection of used equipment. This is separated from the area for receiving clean and sterile supplies.

The exchange method, "clean for used," has been common practice in many hospitals. This method, often employed as a means of controlling supplies, should be discouraged. The checking of supplies and equipment should be made with requisition forms and not against the used supplies. The person assigned to collect used equipment should not deliver the clean and sterile supplies at the same time. The principle of separation of clean and used equipment should also apply to dumbwaiters, elevators, and conveyors used for the transportation of supplies.

A frequent pickup service may prove a great aid in the control of missing items, but it may not be economically sound if the quantity of used items collected does not justify the time and effort employed in this process.

To provide service is one of the basic objectives of the department. Greater economy is another objective that bears due consideration in this procedure. Work simplification has been employed by industry for years. The successful results have increased the productivity by discovering better ways of performing routine tasks and using the effort of the personnel to greater advantage. The motto, "Work smarter rather than harder," is one that could be employed to the advantage of the department, as well as of the hospital as a whole.

Consideration must be given to the areas serviced, as well as to the procedure. The following questions might be asked to evaluate the method used:

- Is there a possibility of spreading infection by the method now used in the collection of used and contaminated equipment?
- Does the method of collection now used endanger personnel performing this function?
- Is used equipment covered enroute so as not to be a source of transmission of disease?
- Is equipment identified by container to be easily sorted in the department?
- Are collection times scheduled for the convenience of the area serviced?

- Are collections made when there is a sufficient amount of equipment to be processed? Was the trip worth making?
- Is the cart used for collection easy to handle?
- Is the route used in collection the most practical?

Careful study might be made of all aspects of this preliminary procedure in the processing of supplies and equipment for reuse in all areas serviced by the department.

PRACTICES

The common practice of rinsing gross soil from equipment on the nursing units should be discouraged. The intention behind this practice is good but the possibility of spreading disease by the scattering of microorganisms in the sink and their spread by the pressure of the water in the form of droplets must be considered. It is generally thought that if an item is rinsed immediately after use much of the bacteria will be washed away. This rinsing is usually done by nursing personnel who may contaminate themselves by this procedure, making them a possible source of infection to the patient. This procedure is also time-consuming. If the objective of the hospital department is to relieve nurses of unnecessary tasks so that they may devote more time to the patient, rinsing should be omitted.

Another practice is that of placing all used items in containers of disinfectant solution. The danger of splashing en route is a possibility and, again, a source of spread of infection. Another reason to discourage the use of this practice is the extra weight of the solution in the containers.

PRECAUTIONS

The following precautions should be observed in the collection of reusable items:

- All supplies and equipment used in patient care should be handled as a potential danger to the control of infection.
- Every area serviced by the department should have a specified area for the containment of used supplies to be collected.
- All items must be made safe for transportation, i.e., used and contaminated equipment should be transported in a manner that will not contribute to the spread of infection.
- The same cart should not be used for the collection of used equipment and for the distribution of clean and sterile supplies and equipment.

PROCEDURES FOR COLLECTING EQUIPMENT

A specified time for the collection of used equipment should be determined by mutual agreement between supervisors of the areas serviced and the supervisor of the CMSSS so as to provide the best service to each area. The time of collection should be determined by each individual hospital, *as needs vary.* A cart easy to handle and large enough for the safe transportation of soiled and contaminated equipment is used, and a closed cart is preferred. This cart should be equipped with several large plastic containers, often referred to as tote boxes, to receive used equipment. The containers should be fitted with plastic liners. The number of containers depends on the type of equipment collected. Ordinarily the equipment would fall into five categories:

1. Glassware, such as syringes and medicine glasses.
2. Rubber goods, such as gloves, catheters, and tubing.
3. Needles—all types.
4. Instruments.
5. Utensils.

The following methods of collection are suggested:

- A plastic-lined tote box is ideal for glassware.
- A plastic-lined bucket is a convenient way of collecting rubber goods.
- For the collection of reusable needles, a small separate container should be provided.
- A plastic-lined tote box is also suitable for the collection of instruments.
- Paper or plastic bags are suitable for the collection of utensils.

At the time of collection the liners are closed and secured and placed in one of the tote boxes on the collection cart.

For an economic evaluation of the procedure the following conditions must be reevaluated:

- Prevention of the spread of infection.
- The service rendered to the nursing care unit and specialty areas.

- The safety of personnel collecting supplies.
- The time and effort involved in the procedure.
- The equipment and technique used in the procedure.
- The total cost of automatic collection service.
- The comparison of all aspects of both procedures.

Receiving

The receiving area of the department may be compared to a clearinghouse. Supplies are received by dumbwaiter, vertical conveyor, cart, or messenger service. These supplies come from all areas serviced, general stores, and laundry.

STOCK SUPPLIES

The materials received from general stores are put into the bulk storage area. These supplies include: (1) dressings; (2) disposable items; (3) parenteral solutions; (4) administration sets; (5) paper or plastic supplies; and (6) supplies requisitioned for processing equipment.

With the increased usage of disposable items that are considered more economical to replace than process, the need for extra storage may influence the procedure for receiving these supplies. This can be best handled on an individual hospital basis, depending on the amount of storage area in the department and the rapidity of the consumption of supplies. This is discussed in detail in the chapter on storage.

LINEN

Linen for sterile packs may be received from either the hospital or a commercial laundry and should be received directly into the linen room or a clean work room. This includes linen used in the assembling of packs, in the preparation of trays and sets, and any other such as wrappers and towels used in processing supplies and equipment.

USED EQUIPMENT

Used equipment received from nursing units and specialty areas are received directly into the cleanup area.

When equipment is returned by dumb waiter or verticle conveyor it should be enclosed in a paper or plastic bag or other closed container.

CONTAMINATED EQUIPMENT

Special consideration must be given to contaminated equipment on the nursing units and specialty areas. This includes all equipment used by patients having or suspected to have a contagious disease which may be the source of cross-infection. Only reusable items should be received by CMSSS.

All equipment to be sterilized by steam must be placed in two steam permeable bags; care must be taken to keep the outer bag clean for transportation and handling. The outer bag must be labeled to identify it as containing contaminated material; color-coded bags are excellent for this purpose. A list identifying the items within the bag must be attached to the outer bag.

Equipment that cannot be sterilized by steam, such as thermometers and sphygmomanometers should be bagged separately for gas sterilization or chemical disinfection. All equipment must be double-bagged to prevent cross-infection, be clearly identified as contaminated, and must include a list of contents. Large items of portable equipment such as suction machines should be chemically disinfected (see chapter VIII) and covered with a plastic bag before being returned to CMSSS for processing, to avoid the hazard of transferring grossly contaminated equipment. (This is a preliminary step in processing in CMSSS to prevent the spread of infection.)

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Chapter IV

CLEANING AND ASSEMBLING

General Considerations

Before delving into the process of cleaning supplies and equipment, consideration should be given to the cleaning of the department. The same high standard of cleanliness that is maintained in the surgical suite should be the aim of CMSSS. Thorough maintenance of all mechanical equipment used in the processing of supplies is not to be overlooked. Table tops, cupboards, sinks, and the like all require daily cleaning. Routine cleaning service by the housekeeping department should be performed at a time when it will not conflict with the work of those employed in the department. It is equally essential to supervise the work of the housekeeping personnel in the CMSSS area as it is in the surgical suite.

Modern standards of cleanliness continue to rise because of the availability of new detergents and cleaning techniques. Establishing standards is not sufficient; every effort should be made to see that they are maintained. This may be accomplished by affirmative answers to the following questions.

- If there are barriers within the department between the cleanup and sterile areas, are they adequate?
- If adequate, has there been any effort to prove it?
- If air-conditioning or electric fans are used in the department, has consideration been given to the possibility of their spreading microorganisms?
- Have personnel been stimulated to maintain high standards of personal hygiene?
- Are the personnel thoroughly aware of the standards of cleanliness that must prevail in the department?
- Do they make a consistent effort to maintain these standards?

Personnel have a vital role in the continuing battle against microorganisms. The problems primarily encountered in achieving effective control are created by people rather than supplies. The proper handling of equipment that has been used or contaminated is not a mere function but an obligation for patient and personnel safety. Therefore, continuous emphasis must be exerted in order to have personnel carry out conscientiously the following preliminary steps.

PRELIMINARY STEPS

Sorting of used items is performed in the cleanup area, not in the receiving area. Sorting is essential for efficient processing. Because many items are cleaned differently and with various cleaning agents, it is much easier and simpler to clean many like-items at one time than it is to process a few of a variety of items.

Cleaning, with the exception of contaminated items, is preliminary to disinfection and sterilization. It is that process used to free a surface from soil or foreign material. It may be accomplished in one or several steps. Much depends on the amount of surface or imbedded soil on the article. Most cleaning operations have three major objectives: (1) the removal of visible soil, (2) the removal of invisible soil pathogens, and (3) the removal of many harmful microorganisms. See chapter VIII for information concerning the processing of contaminated items.

Soaking will remove gross soil. It is also helpful in keeping the wash solution clear of visible soil.

Washing may be done manually or mechanically. Cleanliness is essential for positive sterilization. A decision on washing by hand or by machine depends on several factors, including:

- Can the process be done as efficiently by machine as by hand?
- What is the total cost of the manual operation?
- Is there a sufficient volume to warrant the cost of the mechanical equipment?
- Considering all facets, which method is most effective as well as economical?

Rinsing is included as part of the washing process to remove any sediment on items washed.

Drying is generally considered following the washing process. However, most mechanical devices eliminate hand drying. When hand drying is necessary, use soft, absorbent towels.

SOAPS AND DETERGENTS

The number of different cleaning agents on the market, as well as the various types of supplies and equipment to be processed in the department can pose a confusing situation. Added to these factors, the geographical area may present another problem due to the mineral content in the water. Due consideration must be given to the type of soap or detergent to be used.

Soaps are rapidly being replaced by detergents in many areas because of the residue left by the fatty substance of soap. The word detergent has many definitions which may be summed up as "any substance that, either alone or in a mixture reduces the work requirement of a cleaning process." BEFORE SELECTING A DETERGENT FOR USE, READ THE LABEL. Instructions on detergents from reliable manufacturers will relate what the detergent will do and the percentages of dilution which make it more effective. From these instructions, procedures for the cleaning of articles can be formulated. In addition, most manufacturers, particularly of appliances, recommend suitable detergents.

TYPES OF MATERIAL CLEANED

Aluminum is best cleaned with a mild soap or a neutral synthetic detergent. When manually cleaning aluminum, use a "to-and-fro" motion in the direction of the grain rather than a circular motion.

Glassware should be washed with a mild but effective detergent. All glassware is to be thoroughly rinsed with large amounts of water. For the final rinse, use freshly distilled water. (Although demineralized water also may be used for rinsing of glassware, distilled water is preferred.)

Rubber goods such as hot water bottles, ice caps, throat collars, and other rubber material, should be scrubbed thoroughly to remove chemicals, oil, or grease. The detergent used should be a low-sudsing type. Thorough rinsing is essential. Rubber tubing requires a final rinse of demineralized or distilled water.

As it is not possible for steam to penetrate rubber, all surfaces must be freely exposed to steam during sterilization. This principle applies to any other sterilizing agent that may be used.

Stainless steel should be washed, rinsed, and dried as soon as possible. Mild detergent solution of the organic-acid type is suitable. If large table tops are cleaned, the simplest way is to use long straight strokes, swinging the wrist in a small arc as the direction of the stroke is reversed.

Synthetics are washed with a mild detergent solution and rinsed thoroughly. Most manufacturers of equipment of this type specify the method of cleaning they recommend and the type of detergent to be used.

Special Considerations

Because of the wide variety of items and materials processed it would be impractical to describe a special procedure for each specific item. Many advancements are being made in this area, and changes may improve the present method of processing. Although new materials are being introduced for the packaging of supplies they must be compatible with the method of sterilization.

New mechanical devices, which may have various cycles ranging from pre-rinse to sterilization, have simplified cleaning procedures. Such devices as ultrasonic cleaners, water stills, washers, and washer-sterilizers have greatly improved the efficiency of CMSSS. Care in cleaning and maintaining this equipment is essential, and manufacturers' directions should be followed.

Procedures for Specific Items

Catheters, Tubing, and Drains

Procedure	Manual method	Mechanical means
Cleaning	These items are very difficult to process. It is recommended that they be disposed of after use. As this may not be possible in all cases the procedure is included.	
	1. Soak for 2 hours in warm water with a low-sudsing type detergent.	1. and 2. Same as manual method.
	2. Attach to multiple spout and flush thoroughly with water.	
	3. and 4. Same as mechanical method. (If not available, wash and rinse thoroughly.)	3. Wash in commercial or glove washer.
		4. Rinse through three cycles.
Assembly	1. Flush with distilled water if to be steam sterilized. Catheters and tubes require interior moisture to convert to steam. (Soft flat drains should not be folded when packaged, steam must circulate through lumen). Package dry if gas sterilized.	Same as manual method.
	2. Use paper, muslin, or synthetic wrappers or place in gusset type paper catheter bag.	
	3 Label and identify	
	4. Place in wire basket for sterilization.	
	5 Date after sterilization, noting *expiration date* rather than date of sterilization on each item.	

NOTE: Follow manufacturer's directions for processing all special catheters such as cardiovascular and urethral.

Flasks

Procedure	Manual method	Mechanical means
Disassembly	1. Remove collars and covers before washing flasks. 2 Wash flasks, collars, and covers in mild detergent solution. 3 Rinse thoroughly in two separate rinses of clear water. 4. Follow by final rinse with freshly distilled water. 5. Drain flasks, invert and place on cart. 6. Place collars and covers in basin.	1. Same as manual method 2. Mechanical equipment is recommended for cleaning flasks. Process as recommended by manufacturers.
Preparation	1. Inspect flasks for water breaks, cracks, and cleanliness. 2. Inspect collars and covers for cleanliness and cracks. 3. Fill flasks with freshly prepared solution. Distilled water must be fresh; otherwise it may contain pyrogens. 4. Identify solution; pre-printed labels are available.	
Assembly and sterilization	1. Put assembled unit collar and cap on flask. Automatic sealing closure is a method of choice. The essential feature is a special design which permits free exhaust of vapor during sterilization but still forms a positive seal when temperature in the sterilizer drops to 212° F. when on slow exhaust. 2. Sterilize by steam under pressure. (See chapter IX—Sterilization.)	
After sterilization	3. Date after sterilization. Allow flasks to cool on cart. Tap each bottle on top of cap—you should hear the water-seal click. This distinctive sound is essential for sterility—if not heard, discard solution in flask.	

NOTE: If flasks are not used within 3 hours after washing, rinse again with freshly distilled water.

Gloves

Procedure	Manual method	Mechanical means
Cleaning	Avoid all undue handling of gloves. Place gloves directly in washer.	1. Gloves may be washed in a commercial or glove washer (or may be sent to the laundry for washing and drying). NOTE: Do not overload washer. 2. Water temperature 90°–105° F. 3. Use mild low sudsing detergent. 4. Wash cycle, 10 minutes. 5. Follow with 3 rinses. Add glove powder to final rinse to prevent tackiness. 6. Drying temperature not to exceed 180° F. 7. Drying time, 30 minutes. (Withhold gloves for 8 hours before testing to regain tensile strength.)
Assembly	1. Turn and inspect for cleanliness and dryness. 2. Test for puncture holes using compressed air, or inflate glove by hand. Test all five fingers. 3. Powder by mechanical means. 4. Sort according to size and type. 5. Package—place paper or muslin inserts within palm of gloves and cuff. Use inner wraps for surgical gloves Paper or muslin wrappers may be used. 6. Label and identify, use pre-printed labels. 7. Place in wire basket for sterilization. 8. Date after sterilization. 9. Withhold gloves from circulation for 24 hours after sterilization to regain tensile strength.	Powder gloves as recommended by manufacturer's direction. Use glove powder; never talcum powder.

Instruments

Procedure	Manual method	Mechanical means
Cleaning	1. Open instruments and rinse in cold water to remove gross blood and soil. Remove knife blades and discard. Place instruments in wire basket 2. Clean promptly after use. If instruments are exposed for a period of time, they should be soaked in warm water at 125° F. containing an effective blood solvent or detergent. 3. Use a hand brush with firm bristles on all exposed parts of instruments. 4. Avoid use of sharp cleaners or abrasives. 5. Rinse with hot tap water. 6. Dry while instruments are still hot. NOTE: Instruments should never be stored unless they are thoroughly dried. They will rust, corrode, or be spotted with water marks.	1. Same as manual method. 2. *Mechanical processing with a low-sudsing free rinsing detergent is recommended. NOTE: Contaminated instruments must be disinfected or sterilized before processing. *If washer-sterilizer is not available,* the instruments should be opened and placed in a deep tray, covered with a solution of 2 percent trisodium phosphate and sterilized for 45 minutes at 250° F., or 30 minutes at 270° F. *Use water-tight tray and slow exhaust cycle.* Contaminated instruments should not be placed in ultrasonic cleaner.
Assembly	1. Inspect instruments for cleanliness and working condition. 2. Return unclean instruments for recleaning. 3. Withhold all instruments in poor working condition for repair. 4. Sort instruments categorically. 5. Select and assemble instruments in wire mesh bottom trays for sets. 6. Wrap trays of instruments in muslin wrappers (double thickness) and secure with pressure sensitive tape. 7. Label and identify. 8. Date after sterilization. NOTE: All jointed instruments should be opened to permit sterilizing agent to reach all surface areas.	

*Include such as ultrasonic cleaners, utensil washers and instrument washer-sterilizers.

Note: Contaminated instruments from the surgical suite and the labor-delivery unit should be sterilized before they are sent to CMSSS. Contaminated instruments from nursing units and other specialty areas should be double-bagged before they are sent. See chapter III for further information.

Needles

Procedure	Manual method	Mechanical means
Preliminary sterilization	For the protection of personnel, all used needles are sterilized prior to processing. Needles are placed in a deep tray covered with a solution of 2 percent trisodium phosphate and sterilized for 30 minutes at 270°F. Use water-tight tray and slow exhaust cycle.	Same as manual method.
Cleaning	1. Remove from sterilizer, soak in cool water and rinse under running water. 2. Clean hub with applicator. With a syringe, flush needle with detergent solution. 3. Flush needles with 3 separate rinses of freshly distilled water. Some moisture must be present in the needles if sterilized by steam.	1. Same as manual method. 2. Place needles on rack or adapter. 3. Proceed as directed by manufacturer.
Assembly	1. Inspect needles—for cleanliness and sharpness. A magnifying lens simplifies this step. It is not recommended that needles be resharpened, but when it is necessary to do so, the stylet must be in place and the needle recleaned 2. Sort according to size and type. 3. Package needles individually in paper or glassine wraps; protect tip of needle with paper guard. Stylets are packaged with, not in, the needles for steam sterilization. If glass tubes are used, the open end is covered with a double thickness of muslin or paper wrap, secure with rubber bands. Wrapper should provide safety, convenience and ease of handling. 4. Label and identify if preprinted wrappers are not used. 5. Place needles in wire basket for sterilization. 6. Date after sterilization.	Same as manual method.

Syringes

Procedure	Manual method	Mechanical means
Cleaning	1. Disassemble syringes and soak in cool tap water to remove gross soil. 2. Wash in warm water with a mild detergent 3. Scrub all surfaces with a brush, especially adapter tip. 4. Rinse several times with tap water. 5. Final rinse with freshly distilled water.	1. Same as manual method. 2. Sort and rack according to size. 3. Operate machine according to manufacturer's directions.
Assembly	1. Inspect for cleanliness, damage and identification. Use magnifying lens if possible. 2. Package syringes individually—variety of wrappers are available.* If paper bag is used, gusset type is recommended. 3. Label and identify if preprinted wrapper is not used. 4. Place in wire basket for sterilization. 5. Date after sterilization.	Same as manual method.

*NOTE: If steam sterilized, package disassembled. If dry heat is used, assembled syringes must be dry.

Thermometers

Procedure	Manual method	Mechanical means
Cleaning	Oral and rectal thermometers are washed separately. 1. Thermometers are soaked in a cool disinfectant solution for 30 minutes before processing. 2. Rinse in cool water. 3. Wipe from top to bulb tip with a gauze sponge or cotton ball saturated with a solution of equal parts of 95 percent ethyl alcohol and tincture of green soap. 4. Rinse under cool running water. 5. See mechanical means.	1.–4. Same as manual method. 5. Place thermometers in holders of automatic shakers and follow manufacturer's direction.
Assembly	1. Disinfect in solution of 70 percent ethyl alcohol or 70 percent isopropyl alcohol containing 0.5 percent to 1 percent solution of iodine for 10 minutes. 2. Rinse and place on sterile towel. 3. Package individually in special preprinted thermometer bags.	

Utensils

Procedure	Manual method	Mechanical means
Collection Receptacles		
Cleaning	1. Wash with suitable detergent and warm water. 2. Rinse with clear tap water. 3. Dry thoroughly.	1. Process as recommended by manufacturer.
General Use Utensils		
Cleaning	1. Soak to remove gross soil. 2. Wash in mild detergent solution. 3. Rinse and dry.	1. Process as recommended by manufacturer.
Assembly	1. Wrap in paper or muslin. 2. Label and identify. 3. Sterilize. 4. Date after sterilization.	
Patient Bedside Utensils		
Cleaning	1. Soak to remove gross soil. 2. Wash in mild detergent solution. 3. Rinse in hot water. 4. Dry thoroughly.	The amount and bulk of these supplies warrants the use of a mechanical washer. Process as recommended by manufacturer.
Assembly	1. Package bed pan and urinal individually. 2. Nest tooth cup, emesis and bath basin—package in paper bags. 3. Label and identify. 4. Sterilize.	

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Chapter V

CARE OF PORTABLE EQUIPMENT

General Considerations

An average Central Medical and Surgical Supply Service has some of 50 to 75 different types of portable equipment. They range from an intravenous stand to a circular electric bed. The care of the equipment requires skill, a desire to provide service, and a sincere interest in the improvement of patient care. Frequently, emergency requests are received. It is vitally important that the equipment be in perfect working condition and safe to use. This may appear to be an unnecessary comment but mechanical and electrical equipment that has not had proper maintenance may be more of a hazard than an aid. Preventive maintenance requires time, effort, and consistent attention, but the end results are service and savings, both rewarding benefits.

Practically all new equipment received is accompanied with directions for operation and maintenance. These directions should be protected with a plastic covering and kept available for all in an equipment file or notebook. Every reliable company will furnish demonstrations of operation and directions for the maintenance of equipment purchased. A small-parts drawer file is a handy aid for holding replaceable parts and fixtures. Proper tools make the task easier to perform.

All like items of equipment should be identified by number and recorded when purchased. Maintenance records should be kept on all equipment serviced, and the identification number will facilitate this task. Figure 1 is an example of a maintenance record. Another benefit derived from marking all equipment is greater ease in inventory and control. A record of the location of all portable equipment should be kept in the department at all times.

All equipment should be cleaned with a suitable detergent followed by a topical application of a chemical disinfectant. The element in the equipment is the deciding factor in the choice of detergent and chemical used.

All reusable parts such as drainage bottles, connectors, and tubing should be washed and sterilized. If a part is heat sensitive, gas sterilization may be used. Chemical disinfection is used if gas sterilization is not available. All tubes, plastic or rubber, used internally should be discarded.

All equipment that comes under the broad category of special furniture that is too large to sterilize and requires disinfecting may be processed in the method recommended below.

Specific Procedures

CLEANING PORTABLE EQUIPMENT

Cleaning

- In cleaning area, remove all parts that have been in direct contact with patient, wash in suitable detergent and sterilize.

Figure 1.—Preventive Maintenance Record

Item	Identification No.	Date sent out	Date returned	Service rendered	Serviced by whom
Oxygen apparatus	2	1–6	2–16	Drainage pan repaired	Hospital maintenance.
Oxygen apparatus	6	1–8	1–10	Plug replaced	Hospital maintenance.
Inhalator	3	1–8	2–10	Repainted	Hospital maintenance.
Drainage Pump	7	1–10	1–10	Panel light replaced	Miss P. in CMSSS.
Drainage Pump	4	1–10	1–10	Suction valve replaced	Miss P. in CMSSS.
Oxygen apparatus	2	2–28	3–10	Drainage pan replaced	Jones & Co.

• All accessible surfaces should be washed with a mild detergent solution. Use a damp cloth, begin at the top and work downwards. Casters should be cleaned last.

Disinfecting

• A chemical disinfectant is then applied to all surfaces. Air dry.

• Residual may be removed with a damp cloth rinsed in clear water.

• Dry with a soft cloth to prevent rusting or corrosion. Rubbing will restore original luster of finish.

Inspecting and Testing

• Inspect equipment for cleanliness. Test all electrical and mechanical equipment for working condition. Check all cords, plugs, and connections.

Assembly

• Replace used accessories. Seal ends of connecting tubing and connectors with small glassine or paper bag; secure with rubber band.

• Cover unit with plastic bag and return to storage area.

Figure 2 is an illustration of portable equipment ready for storage. Note suction catheter and charge slip with apparatus.

Examples of portable equipment processed:

• Suction apparatus
• Defibrillator
• Oxygen apparatus
• Alternating pressure pad mattress
• Intravenous stand
• Overhead frame
• Humidifier
• Foot cradle
• Inhalator
• Turning frame

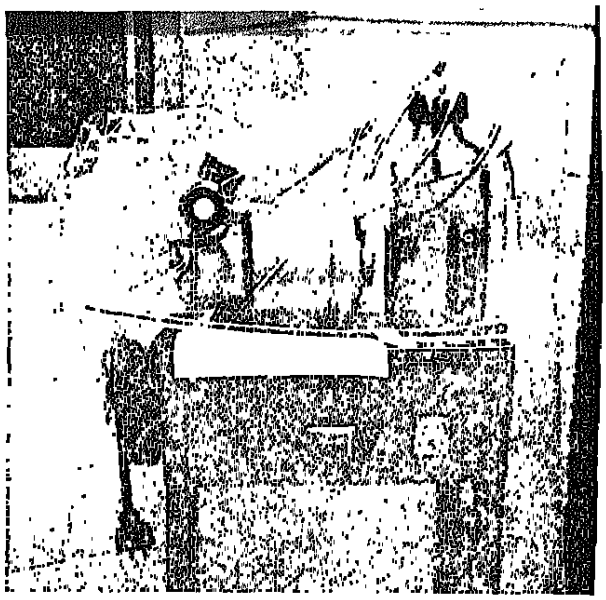

Figure 2. Portable Equipment Ready for Storage.

PROCESSING ACCESSORIES FOR EQUIPMENT

Glass.—Wash bottles, jars, and jugs in the same method recommended for all glassware. Special care must be given to glass connectors. Use a fine brush or pipe-stem cleaner to remove gross soil. Sterilize as directed for glassware.

Metal.—Wash in detergent solution, rinse, dry, and sterilize.

Plastic.—Discard and replace all tubes and connectors that have had direct contact with patient.

Wash alternating pressure mattresses, reusable canopies, and tubing in a suitable detergent, rinse with clear water, and dry thoroughly. Check canopies and alternating pressure mattresses for rents and holes, and repair with plastic cement. Process in ethylene oxide sterilizer. If sterilizer is not available, disinfect in a chemical solution,

air dry, remove residue with clear water and dry. (See chapter VIII.)

NOTE: If gas sterilization is used, cover the alternating pressure mattress or canopy with a sheet and form a roll. Gas must have access to all surface areas.

Rubber.—All rubber tubes that have had direct contact with patient should be discarded and replaced.

Face masks, breathing bags, corrugated tubing and metal connectors should be disassembled, prerinsed with cold tap water, washed with a suitable detergent solution, rinsed with warm tap water and dried prior to gas sterilization or chemical disinfection. Breathing bags should be gas sterilized; face masks, corrugated tubing and metal connectors may be sterilized by saturated steam under pressure. Chemical disinfection is recommended for heat-sensitive items *only* when ethylene oxide gas is not available. A disinfectant which will destroy vegetative bacteria and the tubercle bacillus, such as a phenolic germicide—2 percent in final concentration for a 10-minute exposure period, should be used, followed by a one-minute immersion in 70 percent alcohol and a final rinse with sterile water. These items, following chemical disinfection, require a 4-hour aeration period while items sterilized by exposure to ethylene oxide must be quarantined for a minimum of 24 hours prior to use.

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Chapter VI

PREPARATION OF SPECIAL SUPPLIES AND EQUIPMENT

Treatment Trays and Sets

GENERAL CONSIDERATIONS

The principles applied in preparing the various trays and sets to be used in the different areas of the hospital are essentially the same as those for the processing of all equipment. Simplicity of design and effectiveness of use should be the end result in tray preparation. When the same basic pattern is used for the same type of tray, greater efficiency and economy is realized in time and effort and the possibility of error is less.

The number of trays and sets should be kept to a minimum. Many times one type of tray may be used for several procedures or for variations of the same procedure.

Just as the trays are assembled to meet the needs of the patient, so each item on the tray should meet the need for which it is intended. It has been a common practice in many hospitals to set up elaborate treatment trays with unnecessary amounts of linen and supplies.

Complexity of the setup can be very confusing to personnel. Figure 3 illustrates a basic setup that could be used for all procedural trays with supplies for draping, skin preparation, anesthesia, and surgical closure.

Towels.—In most procedures, towels are used as a drape. Whether it be one towel or four depends on the procedure. Towels are placed on top because they are generally needed first. If a 12- by 16-inch towel will adequately serve the purpose, why use one 18 by 36 inches? If it is more economical to use a disposable towel, then why not incorporate it into the tray setup?

Towel clips.—If towel clips are necessary to keep the towels in place, the logical place is next to the towels. As the clips can be viewed on X-ray, they are omitted on trays that are used in the X-ray department.

Sponges.—On practically every tray, sponges are an essential. Whether it be a cotton filled or all gauze sponge depends on the need. Greater economy can be realized by using the same size whenever feasible for all trays. Setting a standard number to be used, such as 4, 6, or 12, also simplifies the process.

Sponge forceps.—To encourage good technique, sponge forceps should be used. This instrument, which is often referred to as a "sponge stick," may be replaced by a disposable sponge stick. This is made by securing a sponge to the end of a wooden tongue blade with a small strip of steam permeable adhesive tape. Large disposable swabs are now available.

Solution cup.—The container for the antiseptic should be a solution cup, made of different material than the medicine glass.

Medicine glass.—On the basic setup the medicine glass is intended for local anesthetic. Although the ounce glass, as most nurses know it, is gradually being replaced by either plastic or paper disposables, the glass is still the most practical type for CMSSS to use. Glasses may be nested in the solution cup with a sponge between them to permit adequate circulation of steam to all surfaces during sterilization. One of the biggest problems with the glass is the cloudiness that results after repeated sterilizations. When one considers the initial cost and the repeated uses it has before it reaches the cloudy stage, however, it is more eco-

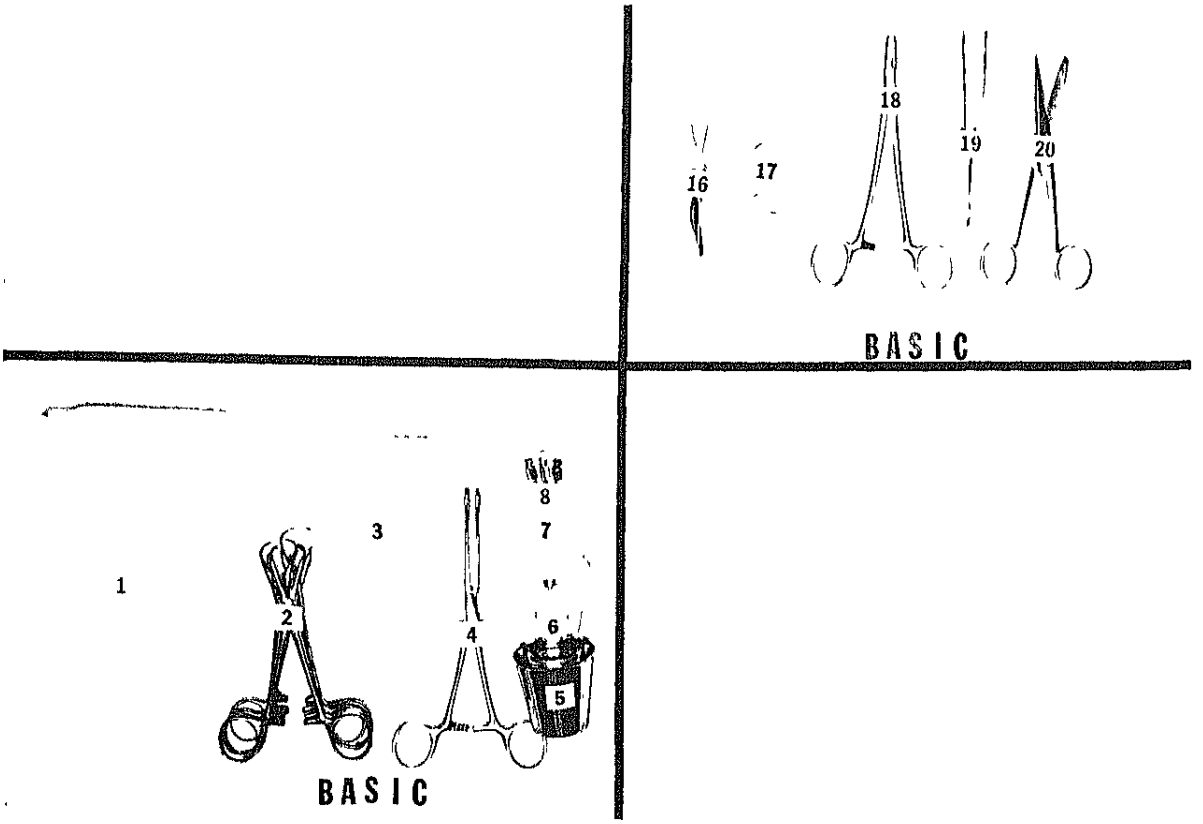


Figure 3. Basic Tray Setup.

NOTE: The items in the lower left section of the photograph are used for draping, skin preparation, and local anesthesia while the items in the upper right section are typical of those necessary for surgical closure. All items are basic to most treatment trays.

nomical to replace it than to spend valuable time and risk in using various acids to remove the stains.

Syringes.—Wherever a local anesthetic is necessary a syringe is needed. Whether a 2-cc. or 5-cc. syringe is used depends again on the areas to be injected. One may prefer to add the syringe to the top of the tray as it is issued but it is generally believed to be better technique to have the syringe on the tray. Syringes are wrapped unassembled to assure contact of all surfaces with steam or gas during the process of sterilization. Unless specified, all syringes should have luer lok tips.

Needles.—Three sizes of needles are recommended: 25 gage by ⅝ inch, for subcutaneous injection; 22 gage by 1½ inch for deep injection; and 19 gage by 1½ inch for withdrawal of anesthetic from vials. Needles are placed in a sponge. Disposable needles are available which withstand sterilization and may be used on trays. Having the needles on a tray is time saving for the physician performing the procedure and the nurse assisting him.

Closure.—Whenever a surgical opening has been made it is generally followed by a surgical closure. Having the suture, suture needles, needle holder, and suture scissors in the same position on all trays decreases the possibility of omission of an item by personnel and aids the physician performing the procedure. (Commercially prepared needles and sutures which withstand sterilization are available.)

Trays.—Sterile trays are classified into two general categories: the *closed* or wrapped tray (shallow, approximately 17 by 11 by ¾ inches) on which all items, including the tray, have been sterilized; and the *open* tray (deep, usually 12 by 6 by 2 inches) on which the items requiring sterili-

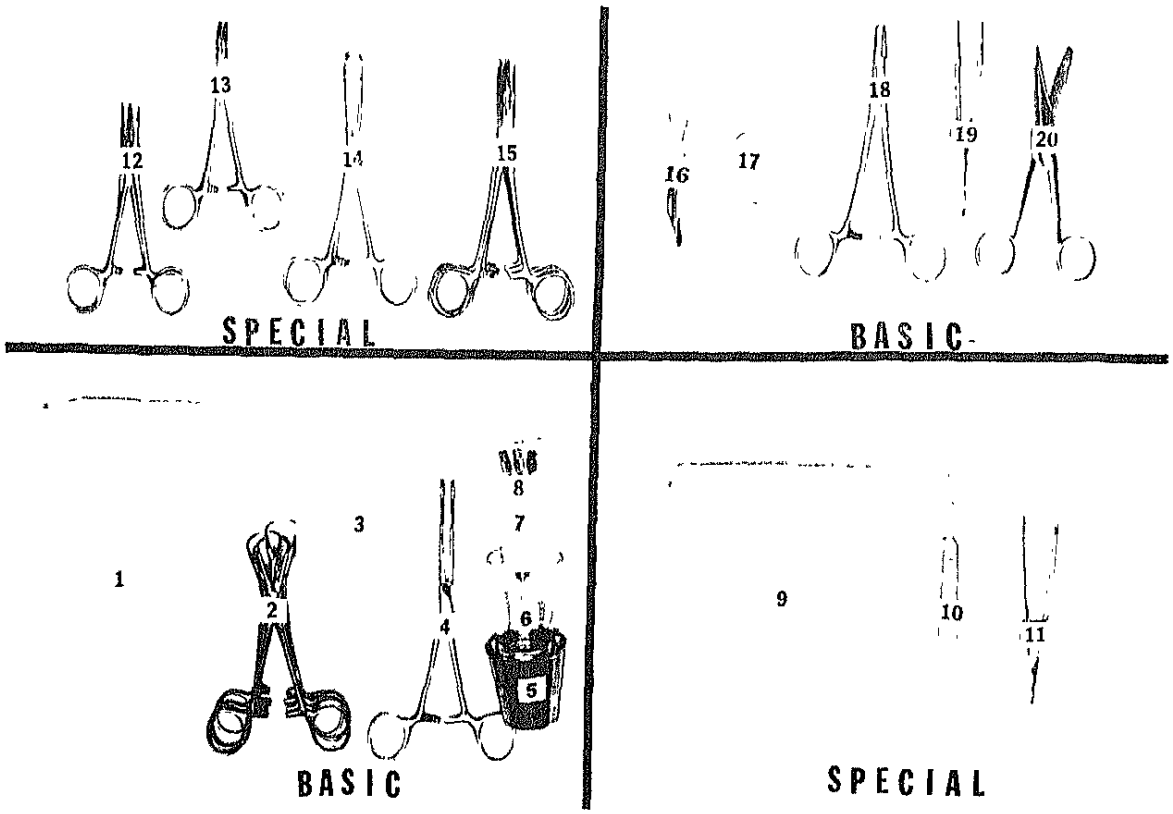


Figure 4. Special and Basic Instruments.

NOTE: The placement of special items as needed in the upper left and lower right sections is illustrated. These special items will vary with each tray whereas the basic sections remain essentially the same.

zation have been wrapped individually and sterilized. The latter usually contains other items that need not be sterile. When the closed tray is prepared, a towel (linen or paper) is placed on the tray to serve as padding for the items.

Trays are marked as to the type and the number when there are several of the same category. The number is also added to the top of the tray after it has been assembled, and aids in following through on the dispensing and return of the tray. For example if spinal puncture tray No. 8 has been dispensed to Mr. Jones on floor No. 3 and returned to central service with the manometer missing, the logical place to check for the missing item would be floor No. 3.

An illustration is always more clear than the written word, and should be used to help CMSSS personnel in tray setup. A photograph, with various items numbered to correspond to the listing below it, simplifies the setting up of the most difficult tray and aids greatly in preventing the omission of an important item. See figure 4, which illustrates the special and basic instruments. Figure 5 illustrates a typical treatment tray.

When the use of the tray is stated, this aids personnel by giving them a better understanding of the purpose of the procedure. It also increases their sense of values by making them recognize the importance of their role and responsibility in the care of the patient and his recovery.

In selecting the type of wrapper to be used, care should be taken to choose a steam-permeable wrapper large enough to insure ample coverage of the entire tray. When muslin wrappers are used, they always should be of double thickness.

Secure trays with pressure-sensitive sterilizing tape and identify with preprinted labels if possible. Identification must be easily visible. Date after sterilization, using expiration date.

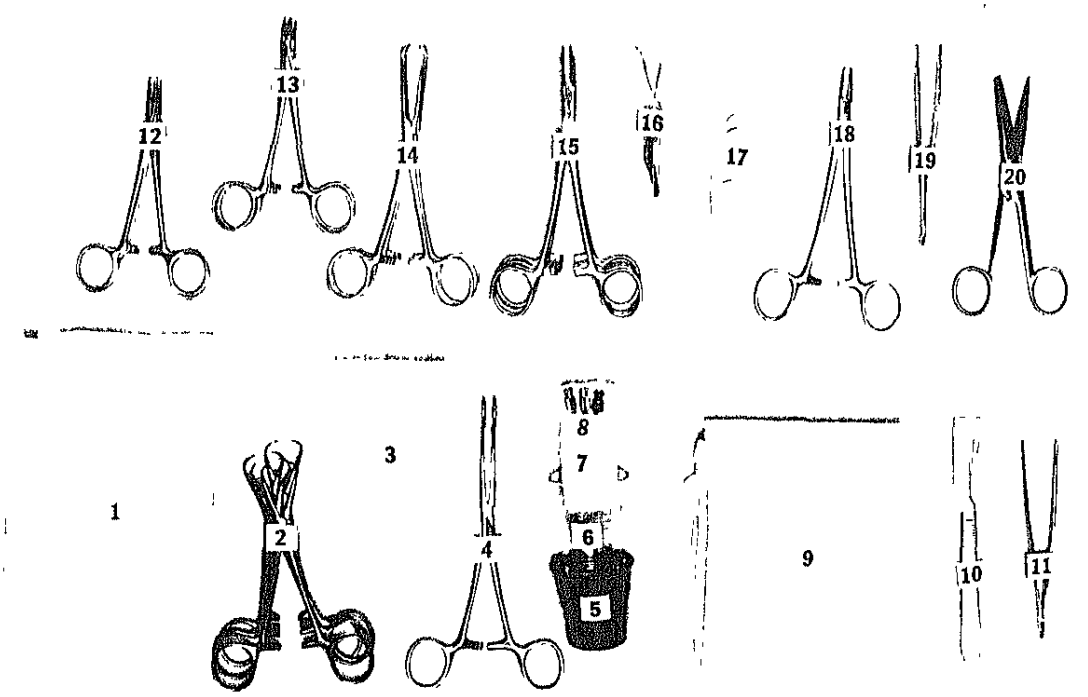


Figure 5. Typical Treatment Tray.

If the tray is one seldom used it may be placed in a plastic bag and heat-sealed before it is stored.

SPECIAL CONSIDERATIONS

In preparing a treatment tray for a sterile procedure, the following factors should be considered:

- To assure sterilization of items, all surface areas should be exposed.
- To prevent contamination in assembling items for use, it is advisable to attach or assemble connectors or tips to tubing before sterilization; however, such items as connectors, tips, and tubing must be wet prior to sterilization in order to achieve sterility.

It is the responsibility of the supervisor to see that this aspect of the procedure is accomplished.

Glassware.—Protect against breakage by wrapping items separately or by placing them in such a position that the linen on the tray will serve as padding.

Instruments.—Place instruments on the tray in the order of their use. Jointed or hinged instruments should be opened to permit contact of the sterilizing agent with all surfaces. Since proper names of instruments are generally omitted, Figure 6 indicates the size of hemostats used on trays.

1. Mosquito is 5 inches
2. Small is 5¾ inches
3. Medium is 6¼ inches
4. Large is 7¼ inches

Rubber goods.—Special care is required for rubber goods. When rubber tubing or catheters are used, they are positioned to prevent any contact with metal or glass items on the tray. All tubing and catheters are flushed with distilled water before sterilization. The residual moisture in the tubing plus the heat of the steam are necessary to achieve sterility.

Utensils.—When utensils such as basins or graduates are used, they are positioned so as to allow steam or gas to circulate freely during sterilization.

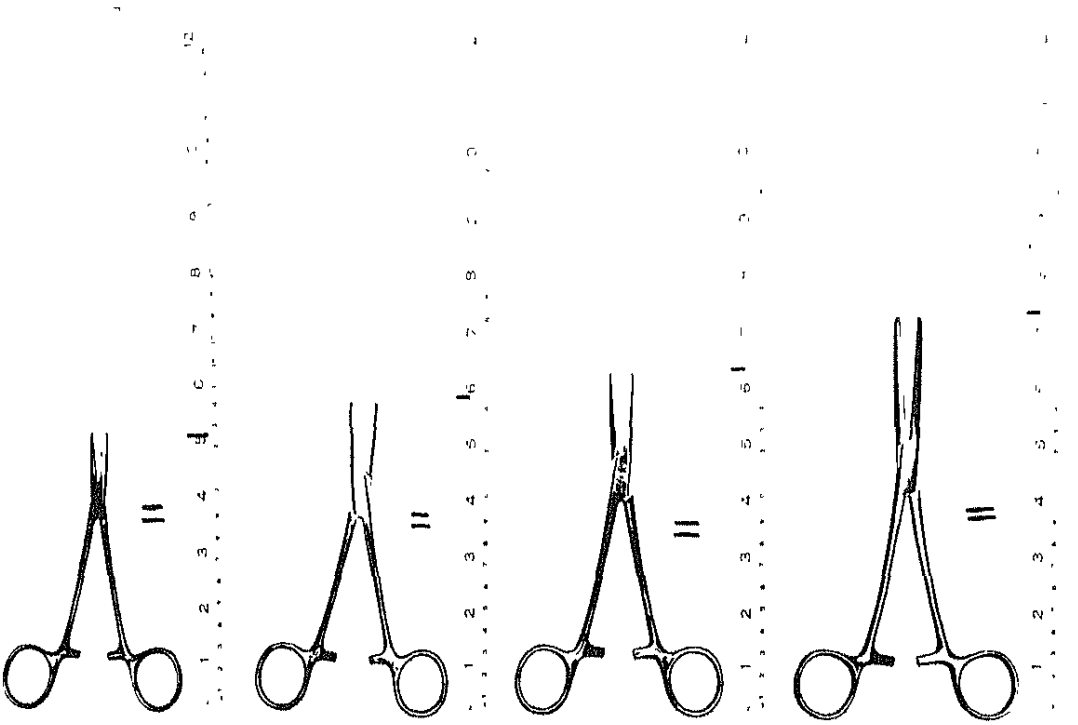


Figure 6. Sizes of Hemostats Used on Trays.

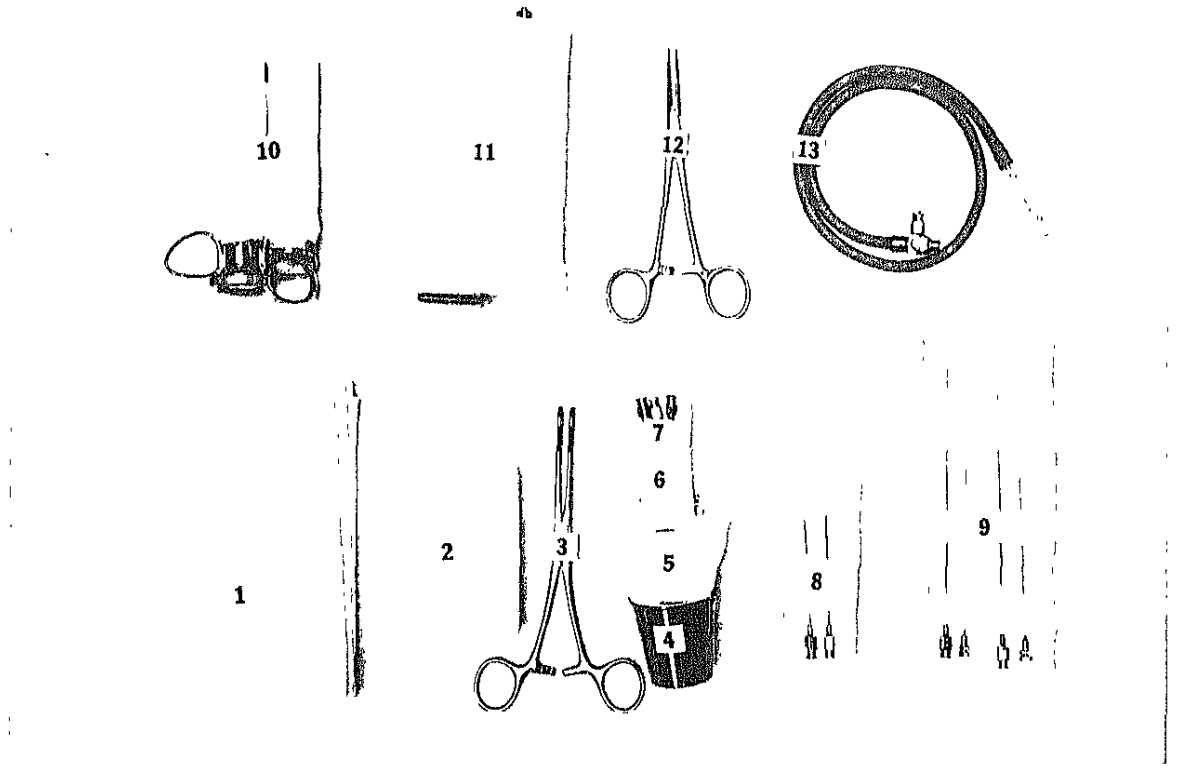
TRAYS AND SETS

On the following pages, 36 trays and sets are illustrated. The legends indicate how the tray is used as well as listing the items displayed. Variables are indicated when applicable, to provide flexibility in adapting the tray setups to the needs and policies of individual hospitals.

The title and type of tray are noted at the bottom of each chart for visibility when placed in an index file. To facilitate the use of these charts by hospitals, a duplicate set is available on 5- by 8-inch cards, for separate purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402.

A treatment tray may be prepared for the latest procedure by assembling items as shown in figures 3 and 4. For example, an intrauterine transfusion tray for the obstetrical patient may be set up by adding radiopaque numbers, strips of pressure-sensitive tape, special transfusion needles, and the like in the space allotted for special items. Extra linen may be placed on top of items in the manner of usage.

A small supplemental tray containing items that cannot be sterilized on the tray but will be used in conjunction with the procedure, may be dispensed with the tray. In many instances one tray may serve many purposes. A contesis tray may be used to remove amniotic fluid as well as fluid from the chest and abdominal cavities.

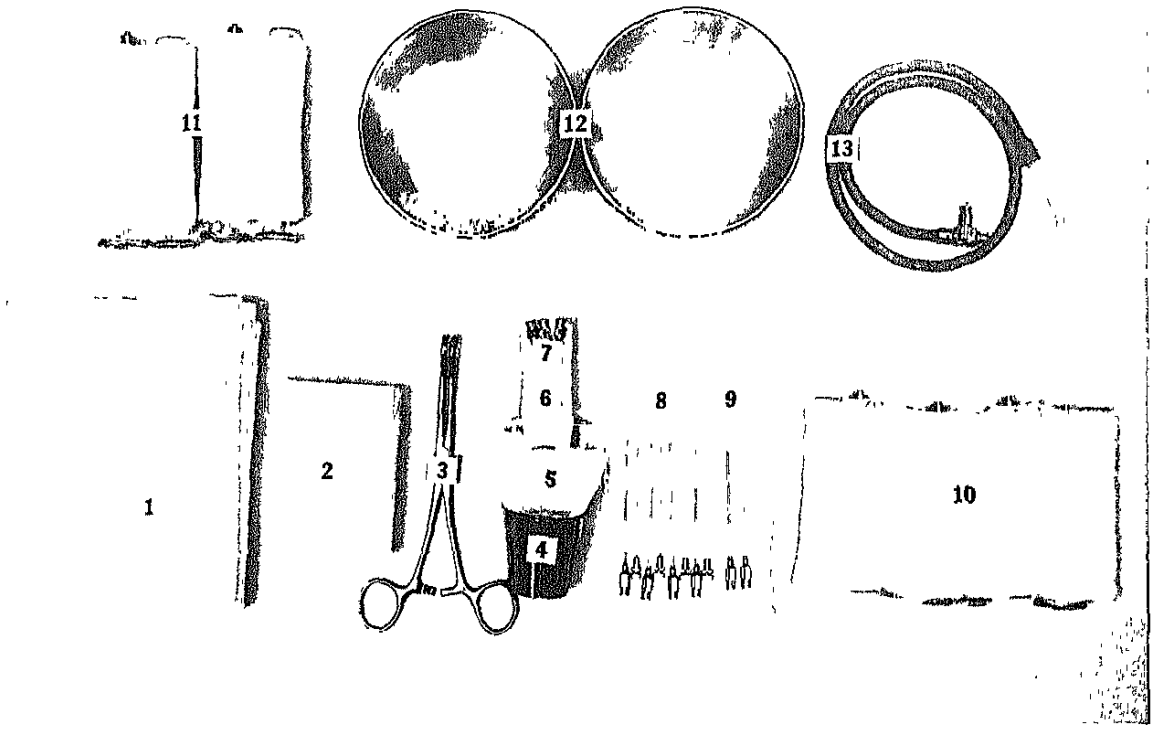


1. AORTOGRAM TRAY

Use: To inject a radiopaque dye so the aorta may be visualized on X-ray.

1. Four towels
2. Sponges
3. Sponge forceps
4. Solution cup
5. Medicine glass
6. Syringe, 2 cc, luer lok
7. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
8. Two needles: 17G–3½ inch
9. Two needles: 17G–7 inch with stylets
10. Syringe, 20 cc, luer lok, with control
11. Syringe, 50 cc*, luer lok
12. One straight medium hemostat
13. Tubing with connector and three-way stopcock**

*Variable: 30 cc. syringe.
**This item may be disposable and dispensed with tray.

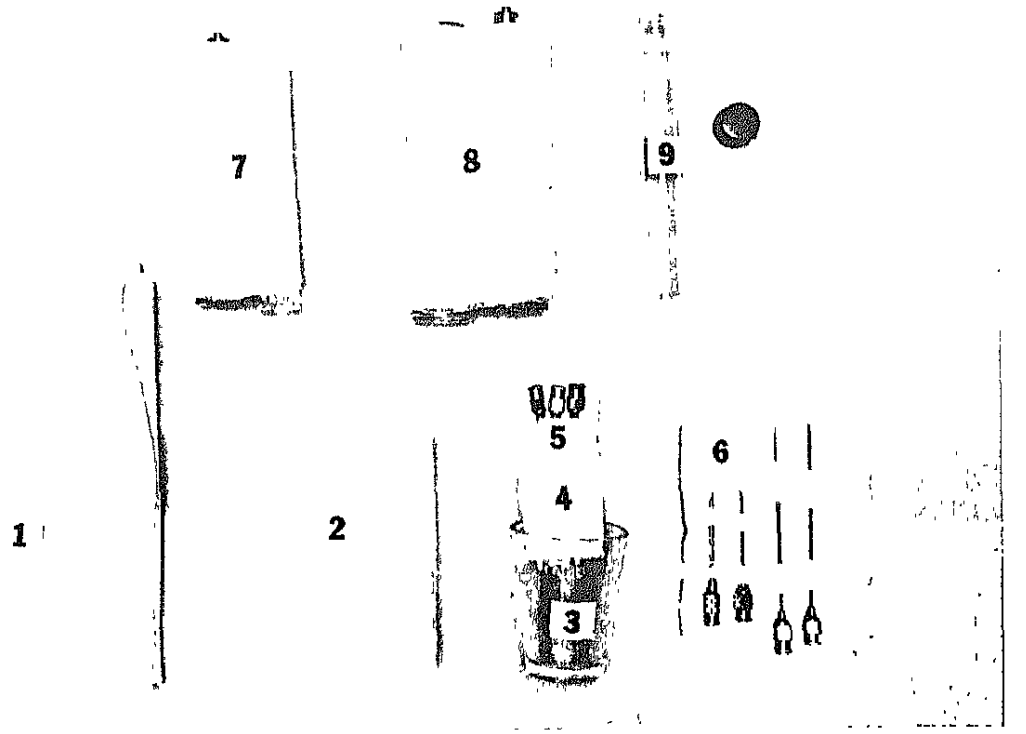


2. ARTERIOGRAM TRAY (angiogram)

Use: To inject a radiopaque dye into the carotid artery so the blood vessels may be visualized on X-ray.

1. Four towels
2. Sponges
3. Sponge forceps
4. Solution cup
5. Medicine glass
6. Syringe, 2 cc, luer lok
7. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
8. Four spinal needles: 18G–3½ inch
9. Two aspirating needles: 19G–3 inch; 16G–3 inch
10. Four syringes, 10 cc, luer lok
11. Two syringes, 20 cc, luer lok
12. Two round basins
13. Tubing with connector and three-way stopcock*

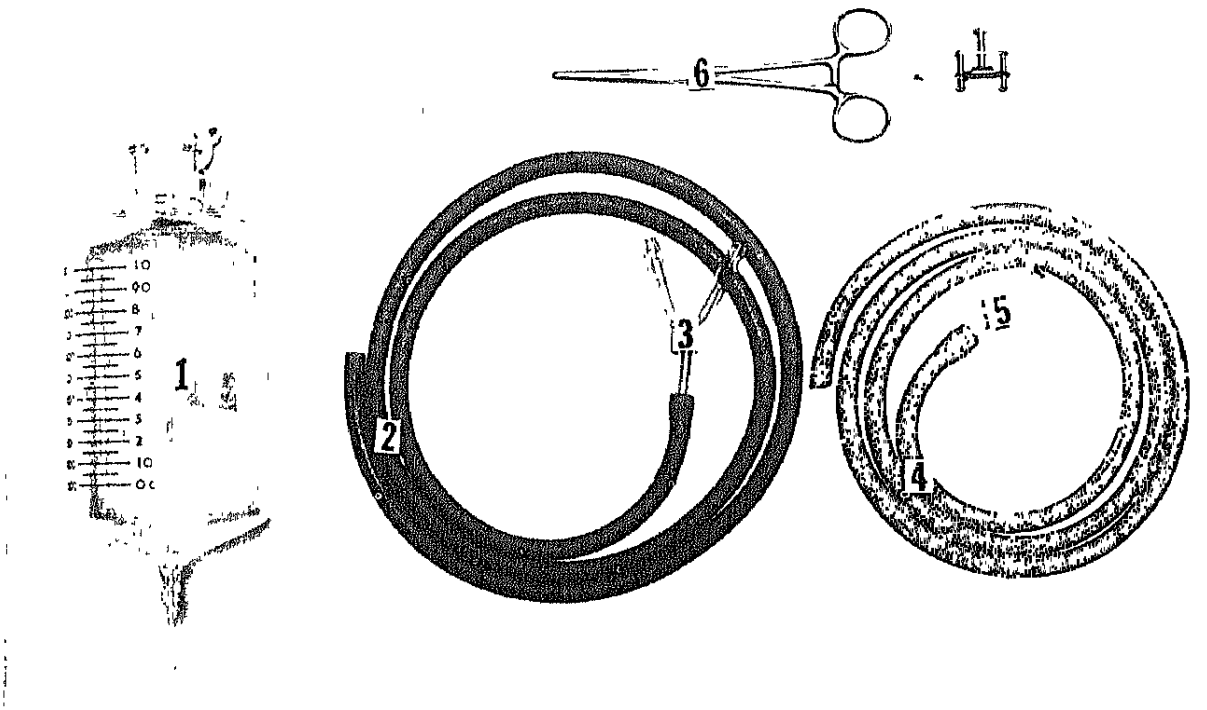
*This item may be disposable and dispensed with tray.



3. ASPIRATING SET (joint aspirating)

Use: To remove fluid from a body cavity or a joint.

1. Towel
2. Sponges
3. Medicine glass
4. Syringe, 2 cc., luer lok
5. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
6. Aspirating needles: two 15G–1½ inch; two 17G–3 inch
7. Syringe, 10 cc., luer lok
8. Syringe, 20 cc., luer lok
9. Culture tube with screw top



4. BLADDER IRRIGATION SET (intermittent or tidal drainage)

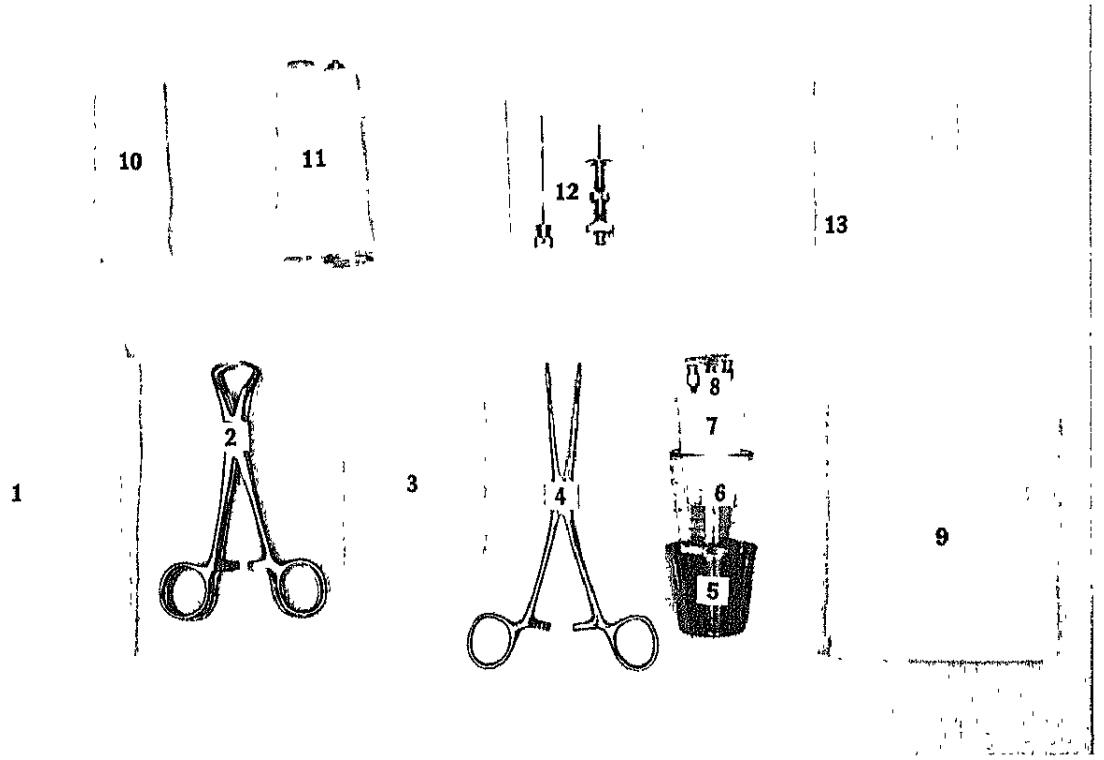
Uses: To clean the bladder. To relieve pain and inflammation. To instill medication or antiseptic into bladder. To restore muscle tone.

1. Graduated flask
2. Rubber tubing 60 inches of $\frac{3}{16}$ inch x $\frac{1}{16}$ inch
3. Glass Y connector
4. Rubber tubing same as No. 2
5. Glass connector
6. Hemostat or clamp

Items 1 through 5 should be wrapped together for sterilization.

Variables: Connectors may be plastic or nylon. Disposable urinary connecting tubes and bags are available.

NOTE: Dispense with graduated gallon jar.

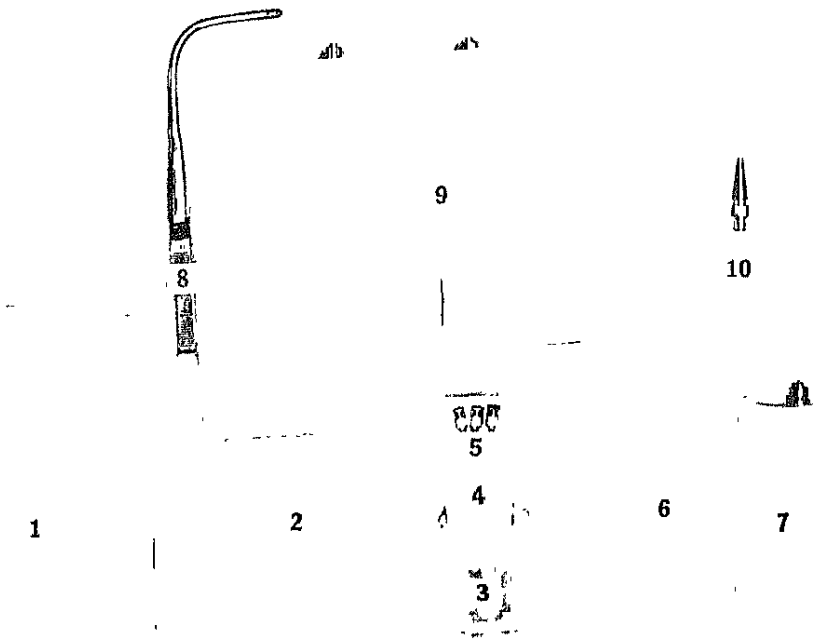


5. BONE MARROW TRAY (sternal puncture)

Use: To obtain marrow from bone for diagnostic purposes.

1. Two towels
2. Two towel clips
3. Sponges
4. Sponge forceps
5. Solution cup
6. Medicine glass
7. Syringe, 2 cc., luer lok
8. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
9. Drape sheet
10. Syringe, 10 cc., luer lok
11. Syringe, 20 cc., luer lok
12. Sternal puncture needle with stylet
13. Two glass slides

Variable: Knife handle No. 3 with No. 11 blade.



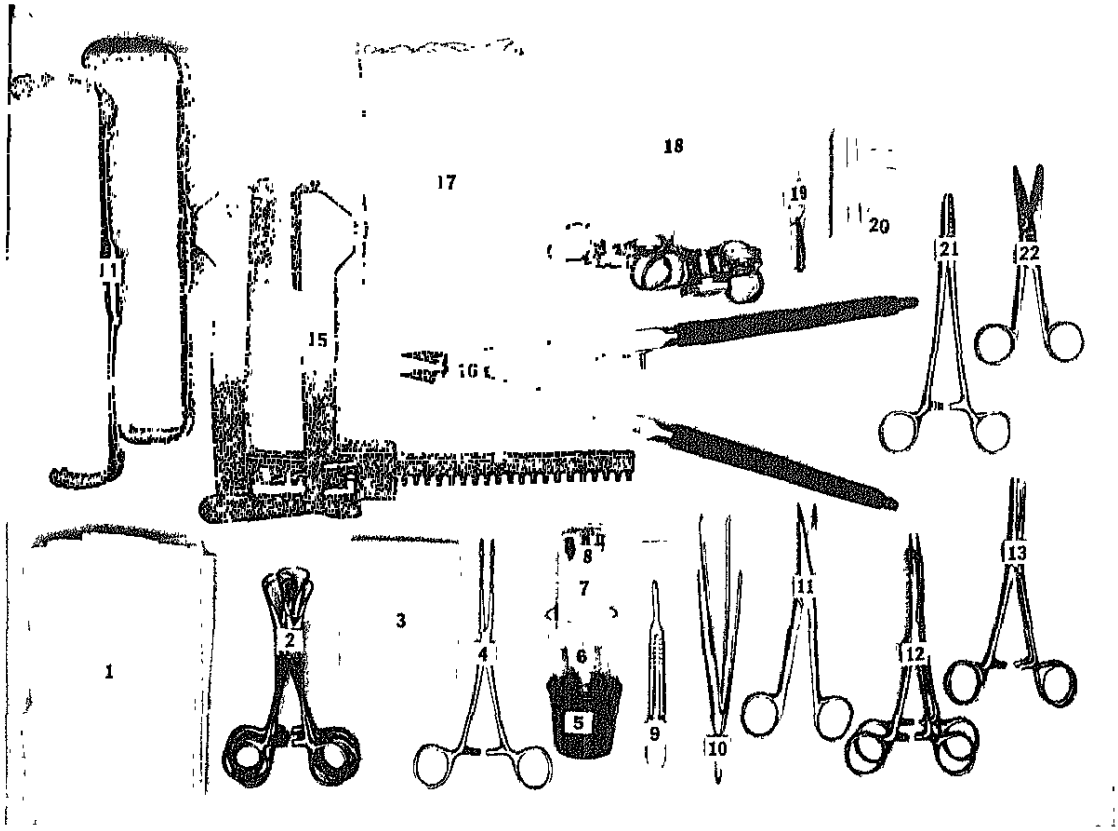
6. BRONCHOGRAM TRAY

Use: To inject a radiopaque dye so that the bronchi may be visualized on X-ray.

1. One towel
2. Sponges
3. Medicine glass
4. Syringe, 2 cc., luer lok
5. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
6. Syringe, 5 cc., luer lok
7. Syringe, 10 cc., luer lok
8. Laryngeal forcep
9. Two syringes, 30 cc., luer lok
10. Metal syringe adaptor

Variable: Laryngeal mirror and cannula.

NOTE: Dispense with small and medium catheters.



7. CARDIAC ARREST TRAY.

Use: To provide for emergency surgical opening of the chest.

1. Four towels
2. Four towel clips
3. Sponges
4. Sponge forceps
5. Solution cup
6. Medicine glass
7. Syringe, 2 cc., luer lok
8. Needles: 25G–⅝ inch; 22G–1½ inch
9. Knife handle No. 4 with No. 20 blade
10. Thumb and tissue forceps
11. Curved scissors, 6¾ inch
12. Two curved hemostats
13. Two straight hemostats
14. Two double ended retractors
15. Rib spreader
16. Rib cutter
17. Ten sponges, radiopaque, 4 inches x 8 inches
18. Two syringes, 10 cc. luer lok, with control
19. Suture, 2–0 black silk
20. Needles: Two straight cutting, two No. 2 round and two No. 4 round
21. Needle holder
22. Suture scissors

Variable: Two needles: 20G–5 inches.

The knife and rib spreader, because of the urgent need for these items, may be placed on top of the assembled items.

CARDIAC ARREST TRAY CLOSED TRAY

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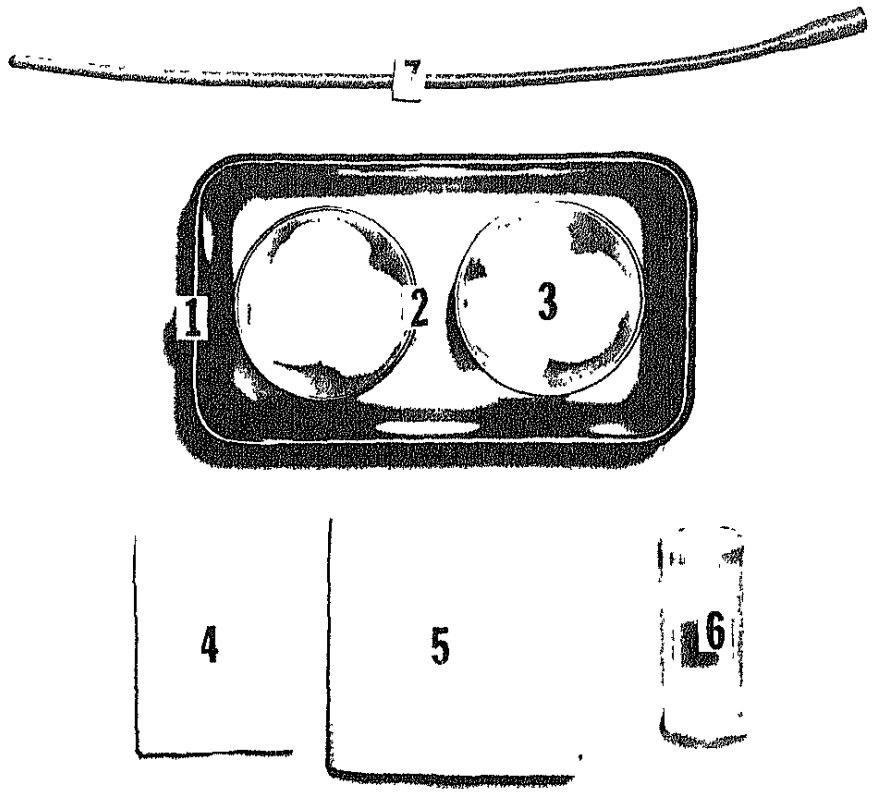


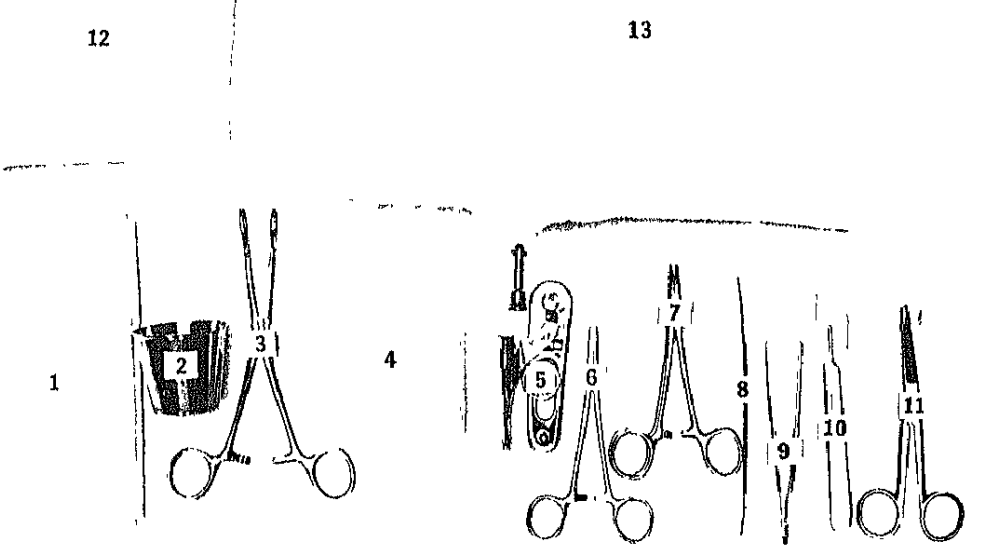
8. CATHETERIZATION TRAY.

Uses: To obtain a sterile specimen. To relieve retention. To empty bladder before surgery.

1. Basin
2. Two small round basins
3. Cotton balls—3 in each basin
4. Gauze sponge
5. Towel
6. Specimen bottle and cap
7. Catheter*

*Variable: May be deleted from tray and disposable dispensed in desired size.

NOTE For pediatrics, dispense with small size catheter. If retention catheter is ordered, dispense desired size.



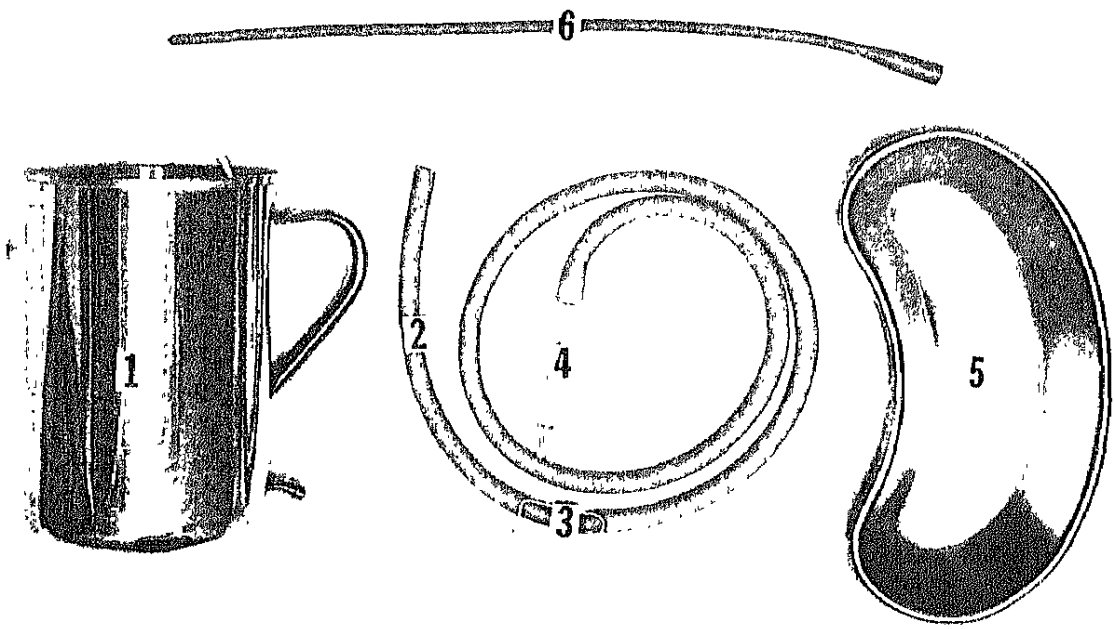
9. CIRCUMCISION SET.

Use: To remove a portion of the foreskin.

1. Two towels
2. Solution cup
3. Sponge forceps
4. Sponges
5. Circumcision clamp (four parts)
6. One straight mosquito forceps
7. Two curved mosquito forceps
8. Probe
9. Thumb forceps
10. Knife handle No. 3 with No. 10 blade
11. Straight scissors
12. Drape sheet and circumsion board cover
13. Gown

Variable: Sterile disposable circumcision clamp may be used. Knife blade may be No. 10 or No. 15.

NOTE: Dispense with vaseline gauze.

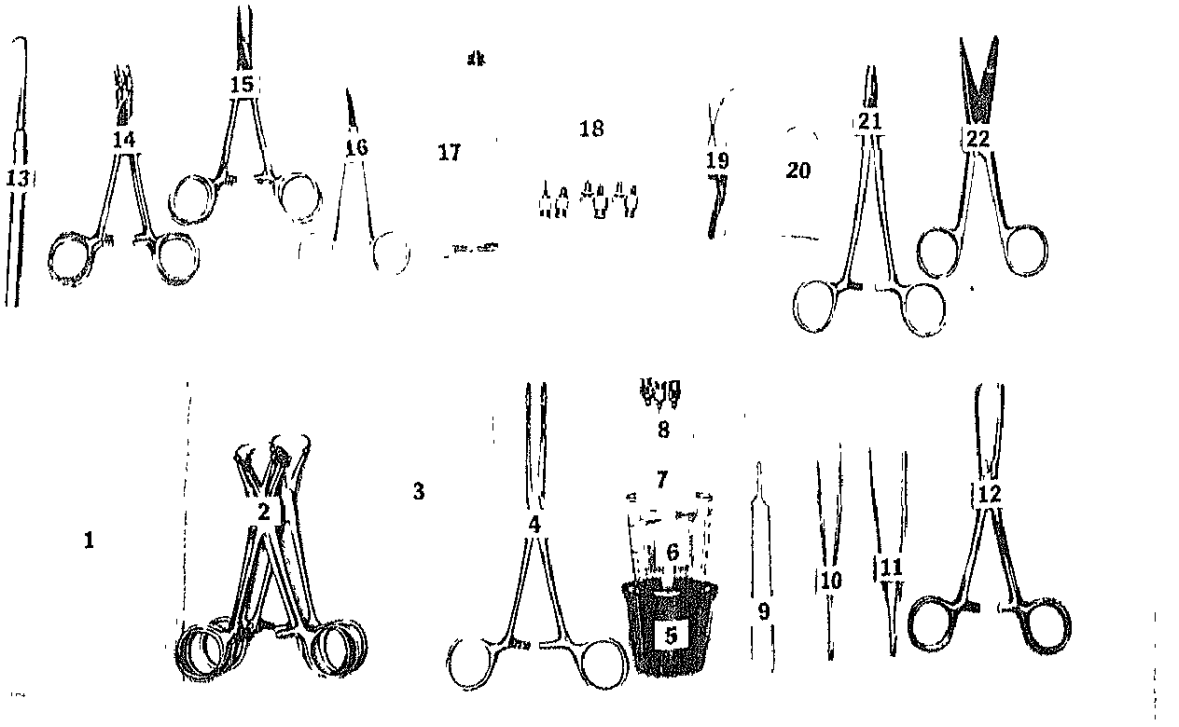


10. COLOSTOMY IRRIGATION SET.

Use: To irrigate and cleanse the colon through colostomy opening.

1. Irrigator can
2. Three feet of tubing
3. Spring clamp
4. Glass connector
5. Curved basin
6. Large catheter

Variable: Connector may be nylon or plastic.



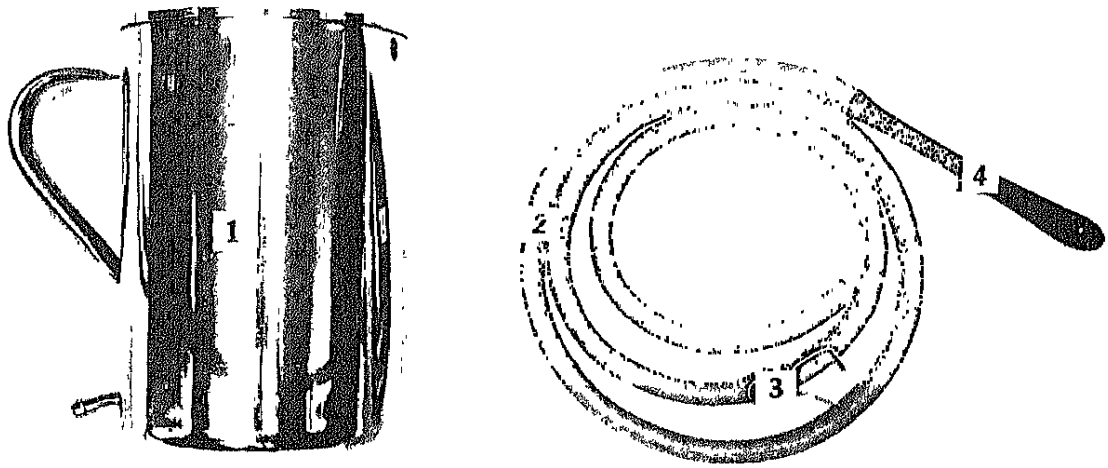
11. CUT-DOWN TRAY (venesection)

Use: To incise the skin to expose the vein to facilitate the administration of blood or fluid.

1. Four towels
2. Four towel clips
3. Sponges
4. Sponge forceps
5. Solution cup
6. Medicine glass
7. Syringe, 2 cc, luer lok
8. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
9. Knife handle No. 3 with No. 15 blade
10. Tissue forceps
11. Thumb forceps
12. Two Allis tissue forceps
13. Vein hook or probe
14. Two curved mosquito forceps
15. Two straight mosquito forceps
16. One iris scissors
17. Syringe, 10 cc, luer lok
18. Cannula needles with stylets: 20G–22G–1½ inches; Blunt needles: 18G–1½ inches; 20G–1 inch
19. Suture—black silk, nylon, size 4–0
20. Suture needles—four ⅜-inch circle cutting edge
21. Needle holder
22. Suture scissors

Variable: Commercially prepared suture with atraumatic needle may be used.

NOTE: Dispense with polyethylene tubing or prepackaged sterile tubing cannula. For pediatrics, dispense with small size polyethylene tubing.

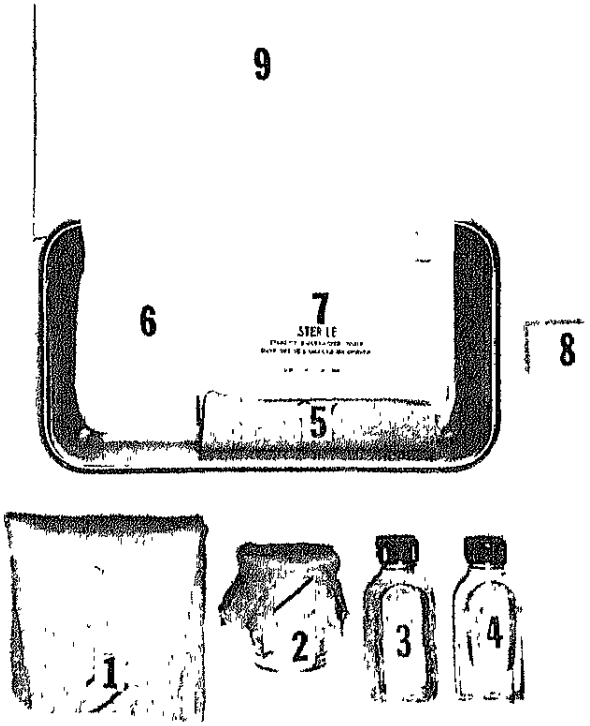


12. DOUCHE SET

Use: To irrigate vaginal canal for cleansing and/or treatment.

1. Irrigator can
2. Tubing
3. Clamp
4. Douche tip

Variable: Add 6 cotton balls.



13. DRESSING TRAY

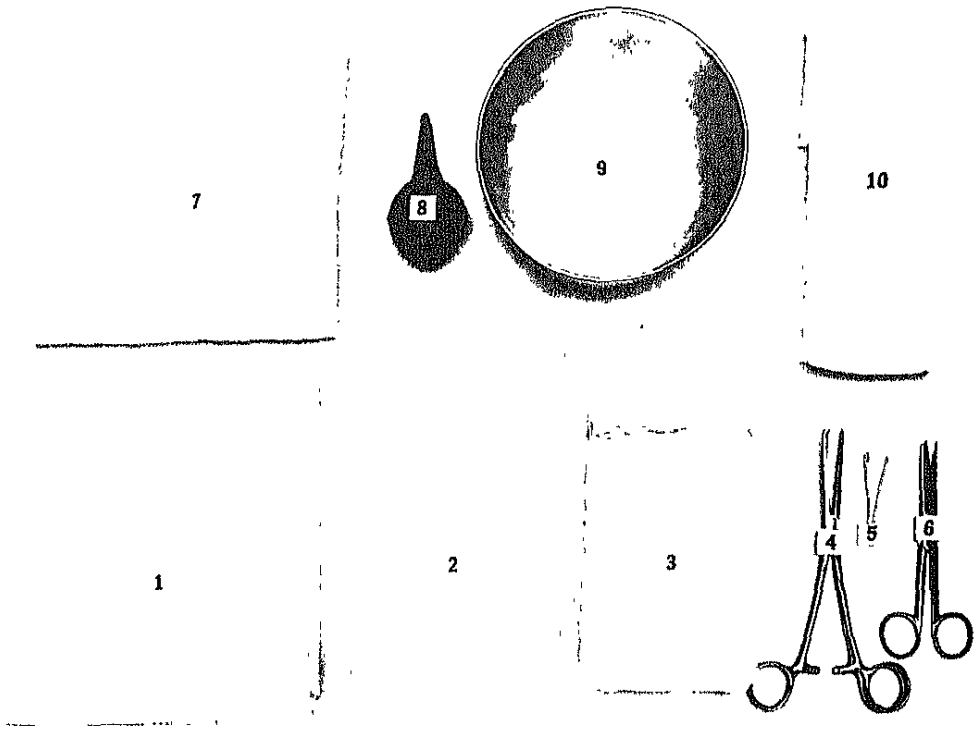
Use: To change surgical dressing.

1. Sterile towel
2. Medicine glass with cotton balls
3. *One ounce of aqueous antiseptic
4. *One ounce of tincture antiseptic
5. Thumb forceps
6. Sponges
7. ABD pad
8. Roll of 1 inch adhesive tape
9. Bag for soiled dressings

NOTE: All dressings are prepacked and sterile. If sutures are to be removed, add suture set which includes thumb forceps, suture scissors, and hemostat.

*Antiseptics are obtained from pharmacist by nursing staff.

DRESSING TRAY OPEN TRAY

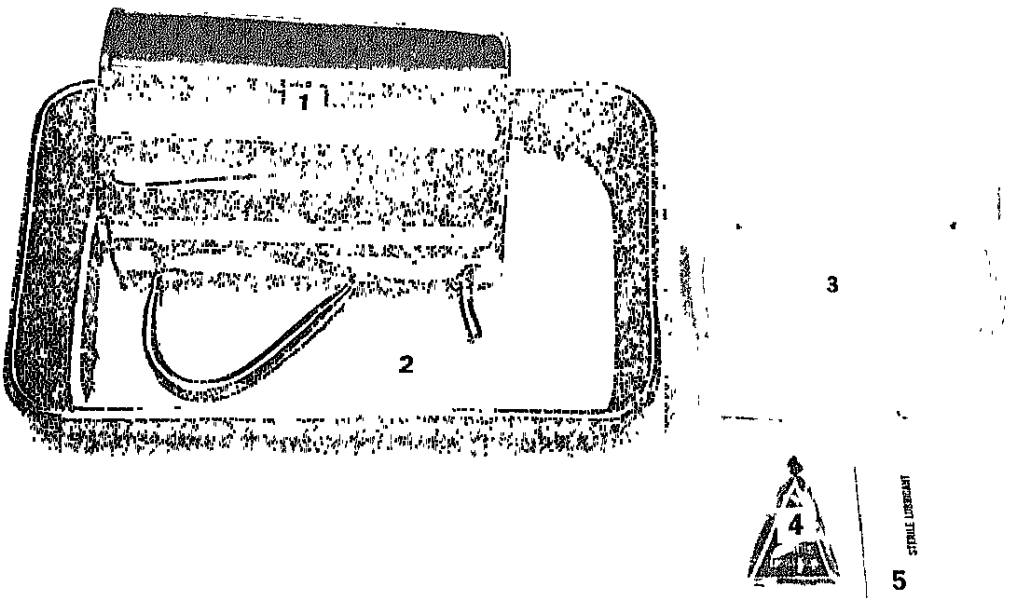


14. EMERGENCY DELIVERY SET

Use: To use for emergency delivery outside of Obstetrical Department.

1. Double sheet
2. Four towels
3. Ten sponges—4 x 8 inches
4. Two large straight hemostats
5. Cord clamp*
6. One pair scissors
7. Baby blanket
8. Bulb syringe
9. Large round basin for placenta
10. Perineal pads

*Variable: cord tie.

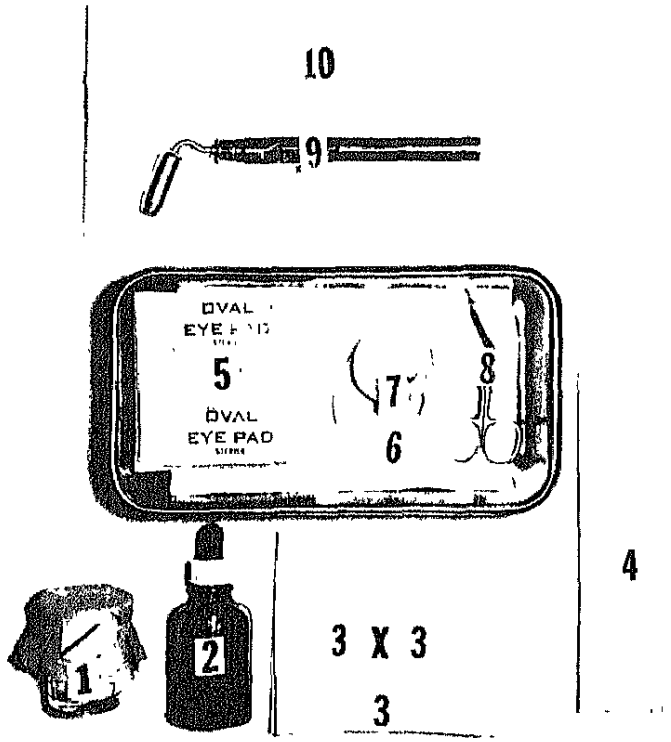


15. ENEMA SET

Use: To instill solution into rectum and colon for cleansing or therapeutic purposes.

1. Irrigator can
2. Plastic coated under-pad
3. Harris flush tube
4. Soap
5. Lubricant

NOTE: Irrigator can is wrapped and sterile when dispensed with set.



16. EYE DRESSING TRAY

Use: To change dressings in order to promote healing and to observe progress in healing.

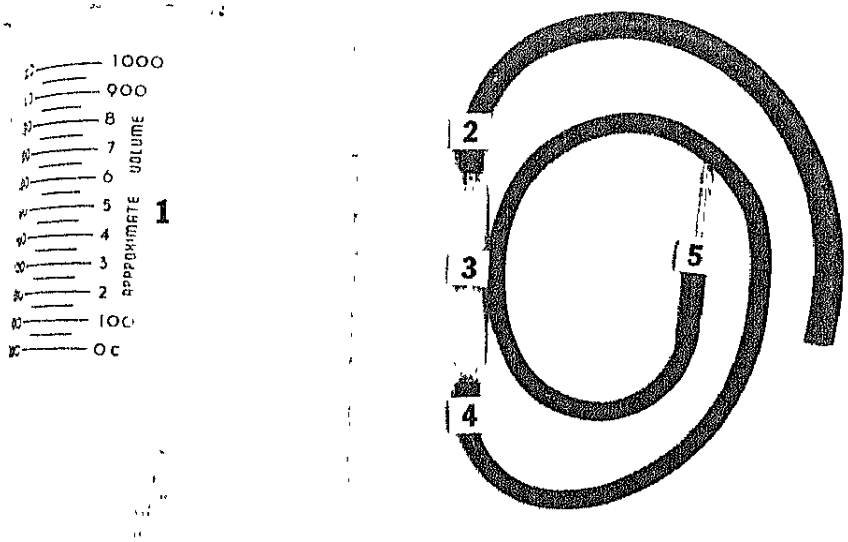
1. Cotton balls in medicine glass
2. *One ounce medicine bottle with dropper
3. Sponges, 3 x 3 inches, all gauze
4. Applicators
5. Two eye pads
6. Roll of ½ inch adhesive
7. Roll of scotch tape
8. Bandage scissors
9. Flashlight
10. Bag for waste

Variable: Metal eye shield.

Note: All dressing supplies on tray are sterile.

*Sterile distilled water for irrigation.

EYE DRESSING TRAY OPEN TRAY



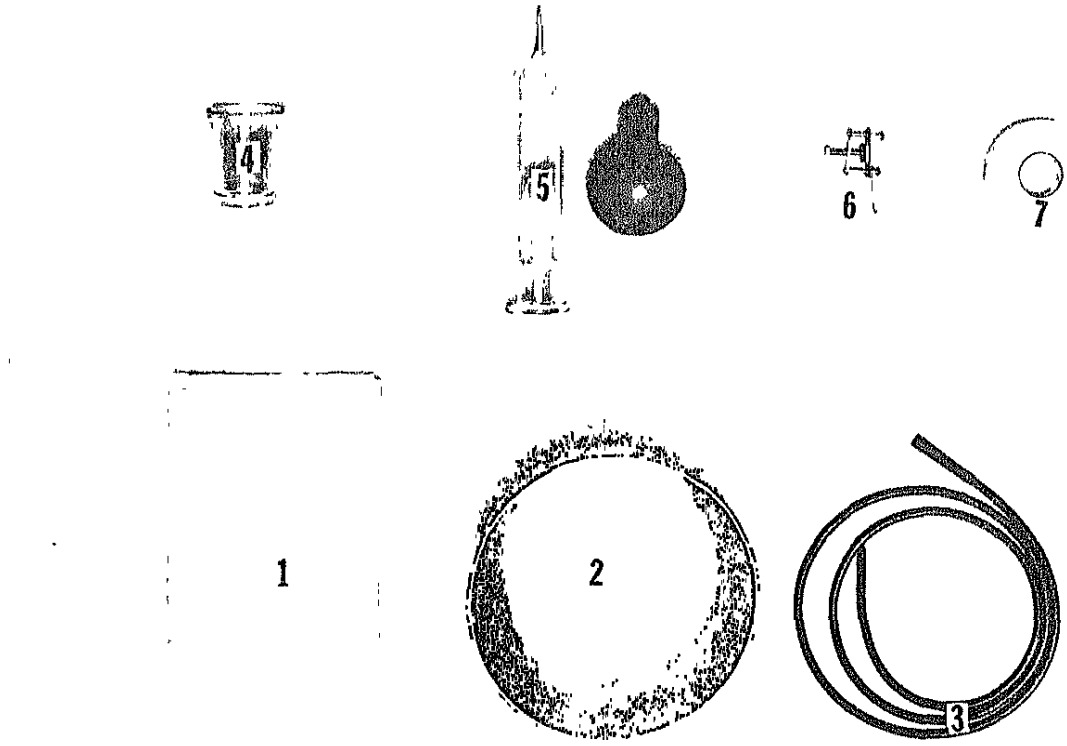
17. GASTRIC FEEDING SET

Use: To provide nourishment when liquids cannot be taken by mouth.

1. Glass flask
2. Tubing—12 inches
3. Murphy drip
4. Tubing—24 inches
5. Glass connector

Variable: Connector may be plastic or nylon.

NOTE: Dispense with desired size of gastric feeding tube and clamp for tubing.



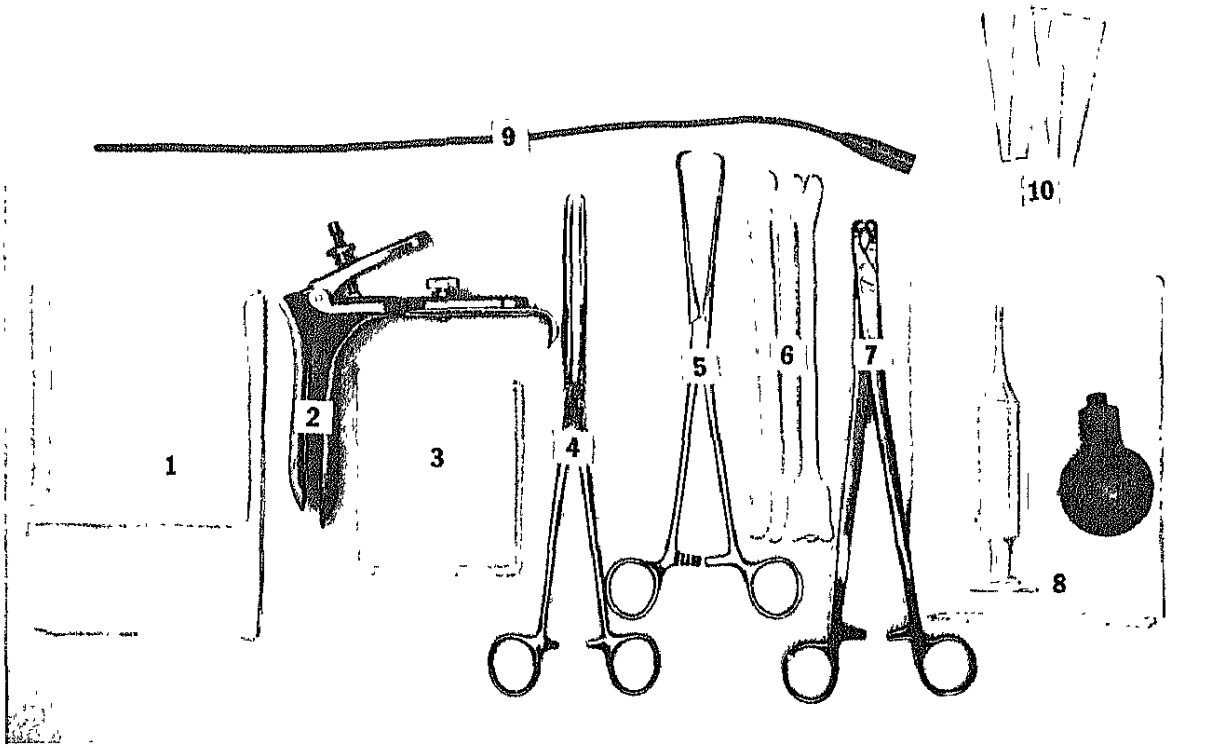
18. GASTRIC SET (analysis or lavage)

Use: To relieve distention. To wash out stomach. To obtain gastric content for analysis.

1. Towel
2. Round basin
3. Gastric tube—16 FR
4. Medicine glass
5. Asepto syringe—2 ounces*
6. Clamp for tubing
7. Adhesive, ½ inch

NOTE: All items except Nos. 6 and 7 are wrapped together for sterilization. When used for analysis dispense specimen tubes with tray.

*Variable: Irrigating syringe, 50 cc., may be used in place of asepto.

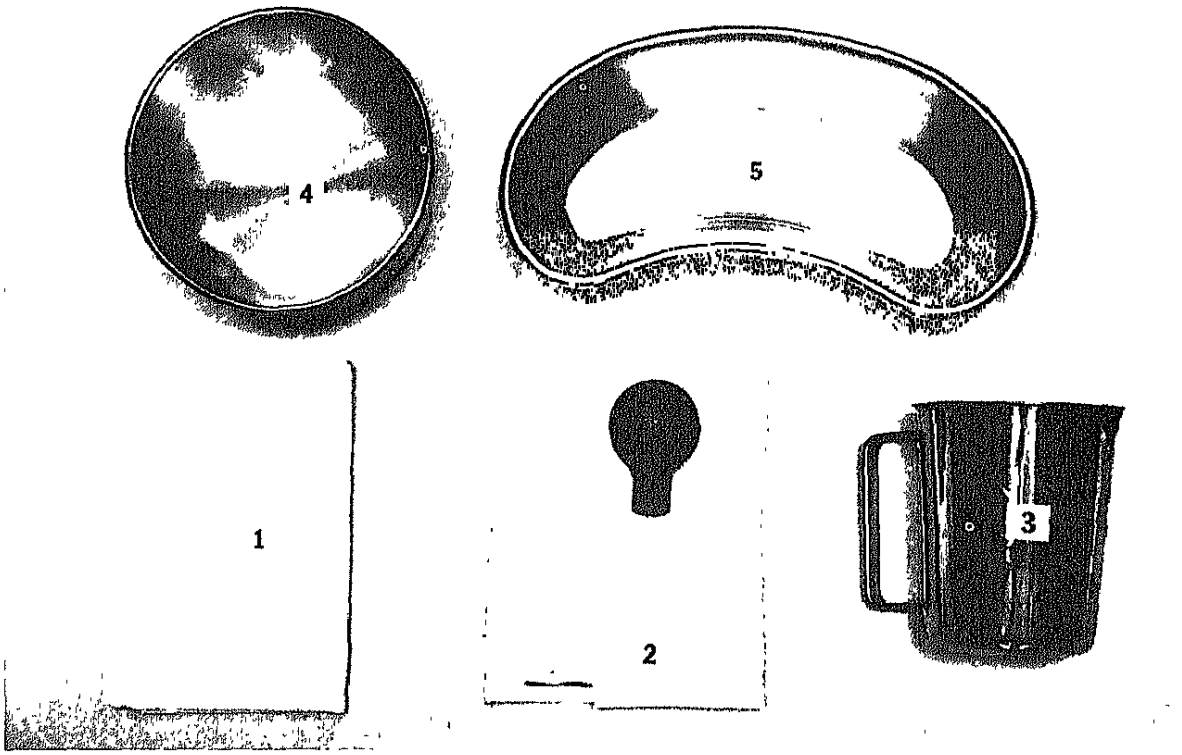


19. GYNECOLOGY TRAY (cytologic)

Use: To obtain a cytological specimen for diagnosis.

1. Towel
2. Vaginal speculum—medium
3. Sponges
4. Uterine sponge forceps
5. Tenaculum
6. Three cervical surface biopsy scrapers
7. Cervical biopsy punch
8. One ounce asepto syringe and bulb
9. Catheter
10. Three glass slides

Variable: Jar of fixing fluid for specimen.



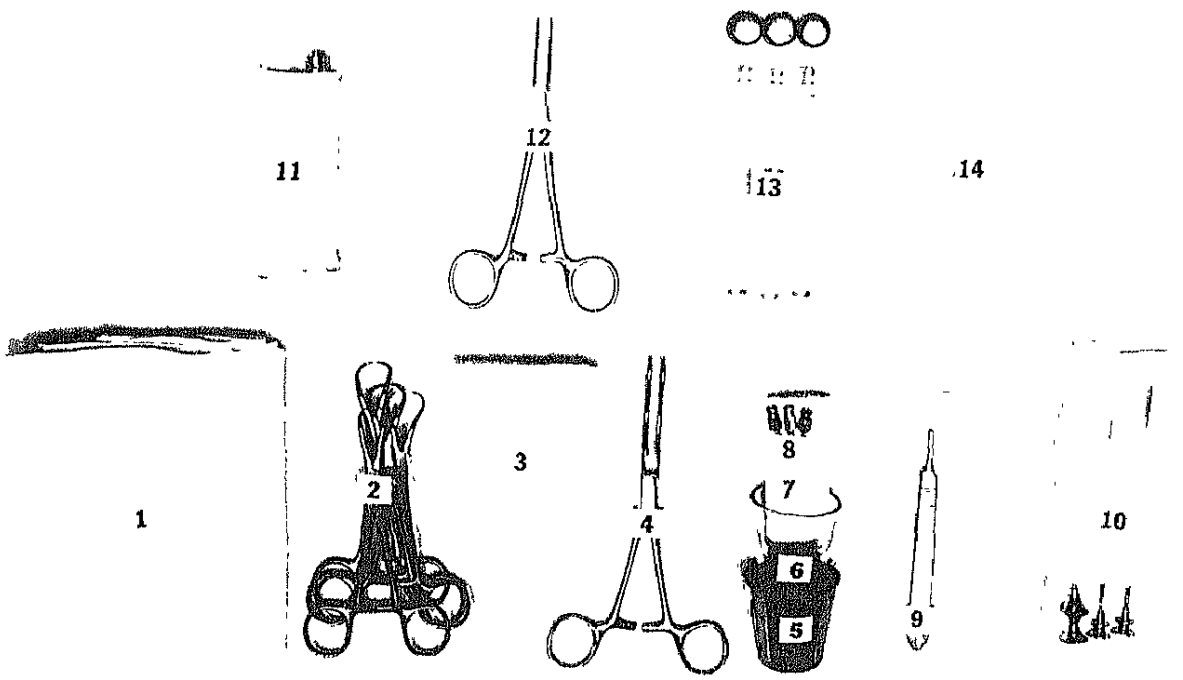
20. IRRIGATION SET

Uses: To irrigate the ear.* To moisten wet dressings. To irrigate gastric tubes. To irrigate indwelling catheters.

1. Towel
2. One ounce asepto syringe
3. Graduate pitcher or bottle, 500 cc.
4. Round basin
5. Curved basin

Variable: Gauze sponges.

*Add short rubber guard to syringe tip for ear irrigation.



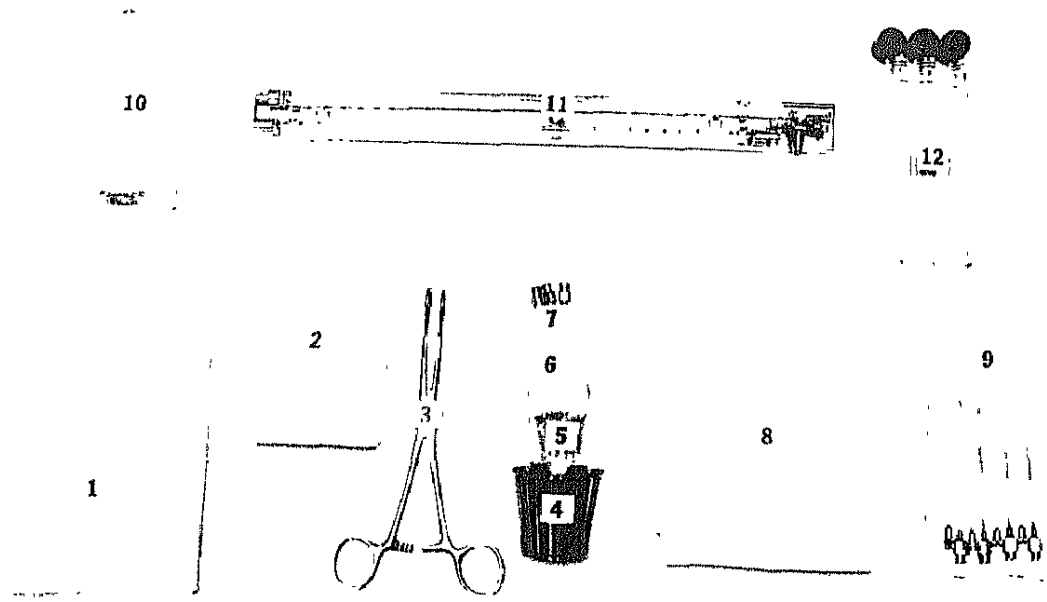
21. LIVER BIOPSY TRAY (kidney)

Use: To obtain specimen of liver or kidney tissue for diagnostic purposes.

1. Four towels
2. Four towel clips
3. Sponges
4. Sponge forceps
5. Solution cup
6. Medicine glass
7. Syringe, 2 cc., luer lok
8. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
9. Knife handle No. 3 with No. 11 blade
10. Biopsy needle—three parts
11. Syringe, 10 cc., luer lok
12. Hemostat, 5½ inches, medium straight
13. Culture tubes with screw tops
14. Three glass slides

Variable: Spinal needle 22G–5 inches.

NOTE: This tray may be used for kidney biopsy—add Menghini needle.

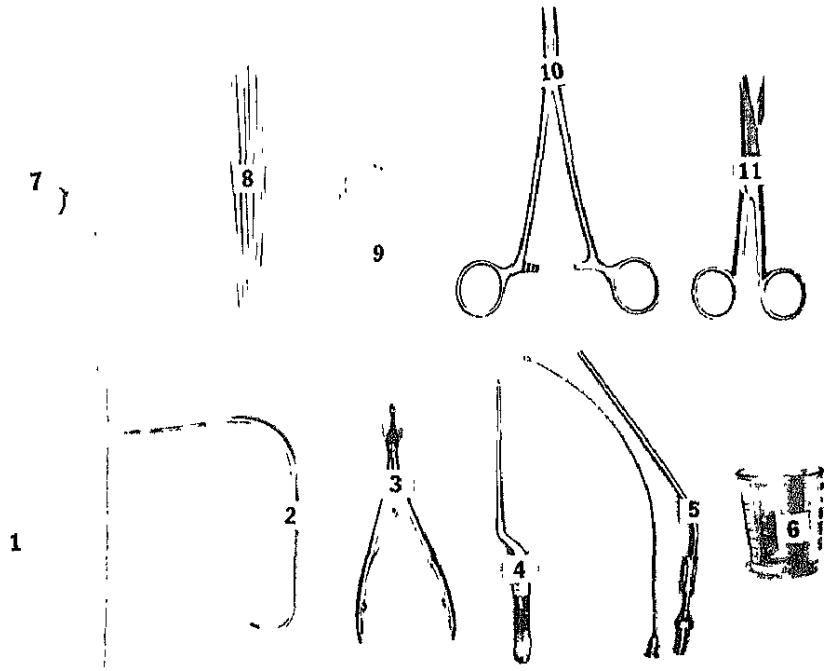


22. MYELOGRAM TRAY

Use: To inject a radiopaque dye so that the subarachnoid space may be visualized on X-ray.

1. Four towels
2. Gauze sponges
3. Sponge forceps
4. Solution cup
5. Medicine glass
6. Syringe, 2 cc., luer lok
7. Needles: 25G–⅝ inch; 22G–1½ inch; 19G–1½ inch
8. Drape sheet
9. Spinal needles: Two 18 G–3 inch; one 19G–3½ inch; one 20G–3½ inch
10. Syringe, 10 cc., luer lok
11. Spinal manometer and three-way stopcock
12. Three culture tubes with screw tops

MYELOGRAM TRAY CLOSED TRAY



23. NASAL HEMORRHAGE TRAY

Use: To aid in controlling nasal hemorrhage.

1. Two towels
2. Tongue depressor
3. Nasal speculum
4. Bayonet forceps
5. Nasal suction tip and obturator
6. Medicine glass
7. Cotton balls
8. Applicators
9. Nasal tampons
10. Curved medium hemostat
11. Scissors

NASAL HEMORRHAGE TRAY CLOSED TRAY

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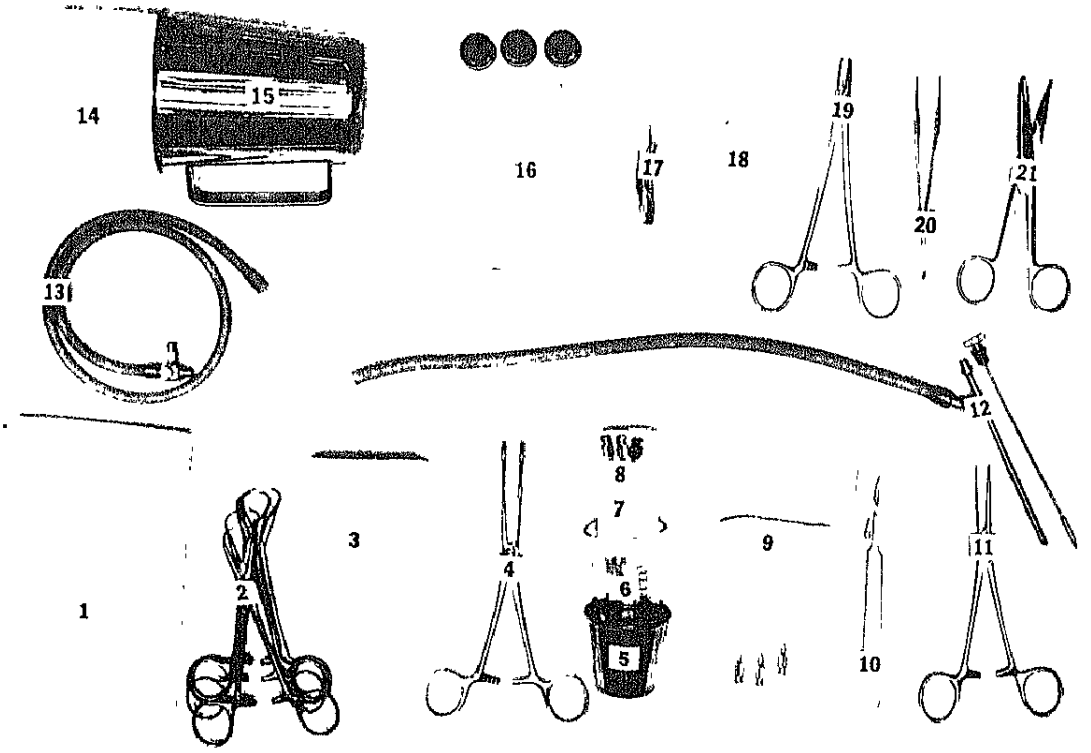
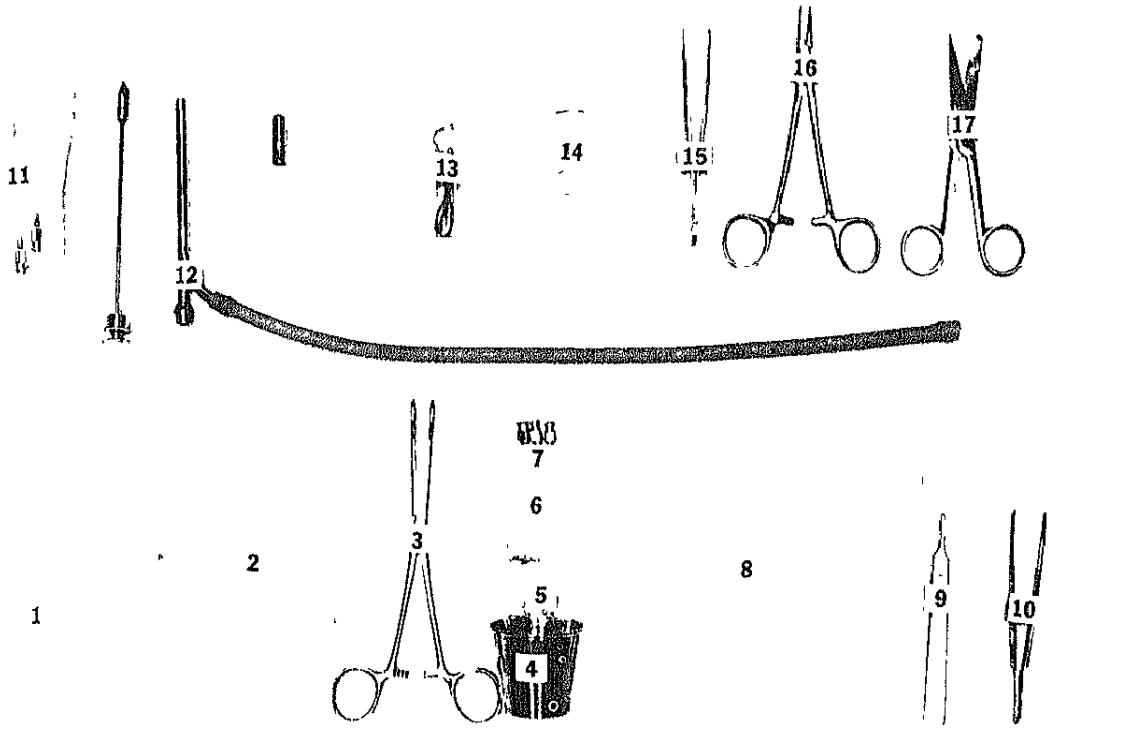


24. PARA-THORACENTESIS TRAY (amniocentesis)

Uses: To remove fluid from the pleural or abdominal cavities. To relieve pain. To secure a specimen for diagnosis or to instill medication.

1. Four towels
2. Four towel clips
3. Sponges
4. Sponge forceps
5. Solution cup
6. Medicine glass
7. Syringe, 2 cc., luer lok
8. Needles: 25–⅝ inch; 22G–1½ inch; 19G–1½ inch
9. Aspirating needles: 15G–3½ inch; 17G–3½ inch; 13G–3 inch
10. Knife handle No. 3 with No. 11 blade
11. One straight hemostat
12. Trocar with 30-inch rubber tubing
13. Rubber tubing, 10-inch length with three-way stopcock and glass needle adapter
14. Syringe, 50 cc., luer lok
15. Graduate, 500 cc.
16. Three culture tubes with screw tops
17. Silk suture, 3–0 or 4–0
18. Suture needles
19. Needle holder
20. Tissue forceps
21. Suture scissors

Variable: Sterile bucket for excessive amount of fluid.

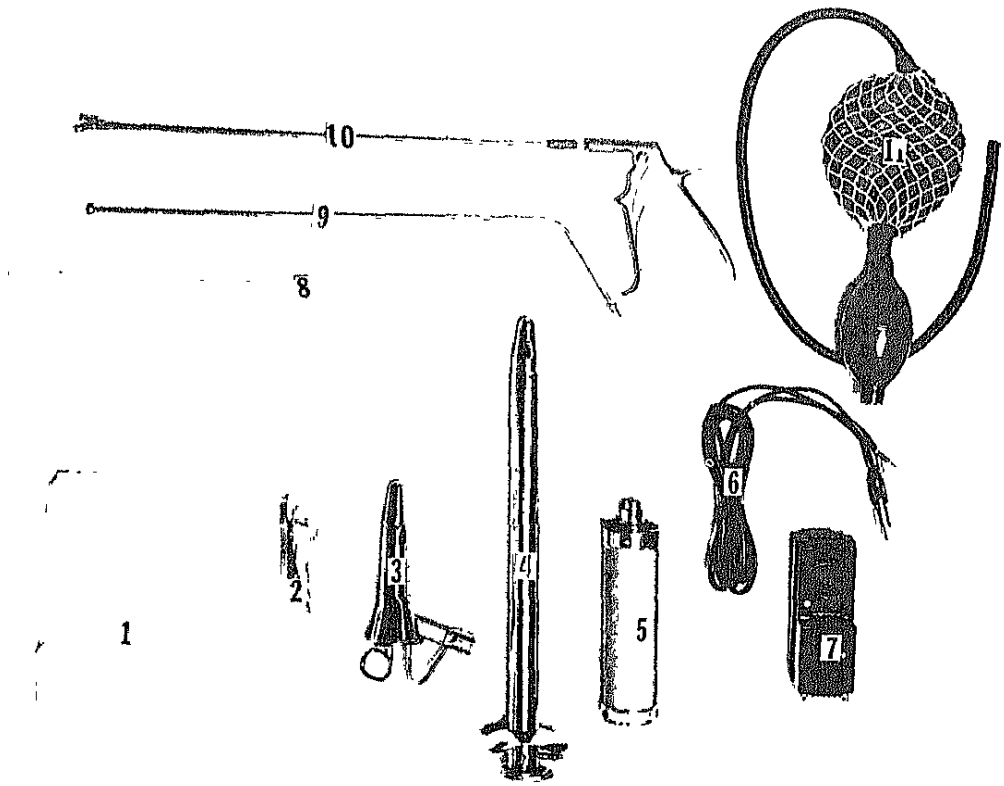


25. PERITONEAL DIALYSIS TRAY

Use: To instill a dialyzing solution into the peritoneal cavity in order to extract renal waste products and toxins.

1. Four towels
2. Sponges
3. Sponge forceps
4. Solution cup
5. Medicine glass
6. Syringe, 5 cc.; luer lok
7. Needles: 25G–⅝ inch; 22G–1½ inch
8. Drape sheet
9. Knife handle No. 3 and No. 11 blade
10. Thumb forceps
11. Aspirating needle, 15G–3 inch
12. Trocar with tubing and glass connector
13. Suture—black silk
14. Suture needles
15. Tissue forceps
16. Needle holder
17. Suture scissors

NOTE: Dispense special dialysis tubing with tray; dialysis solution to be obtained from pharmacist.

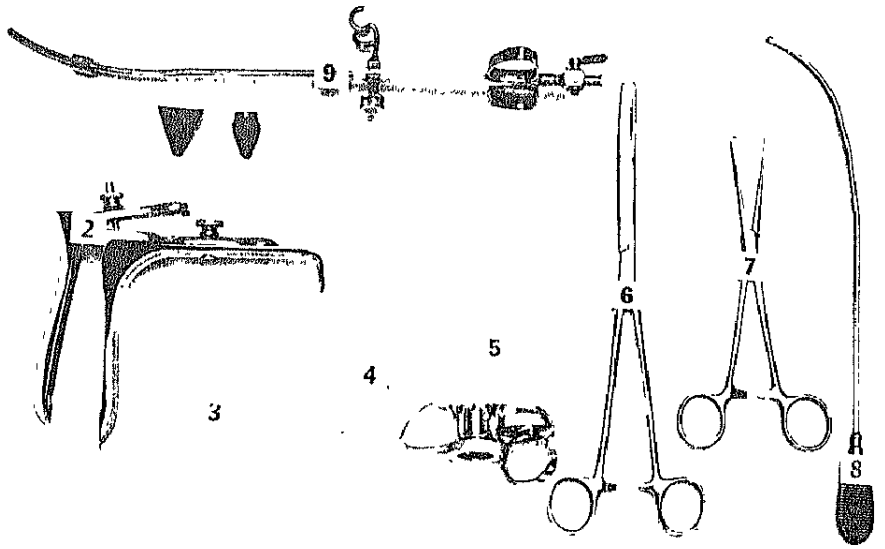


26. PROCTOSCOPY OR SIGMOIDOSCOPY SET

Use: To examine the rectum and sigmoid colon.

1. Towel
2. Lubricant
3. Proctoscope with obturator and light
4. Sigmoidoscope with obturator and light
5. Battery handle
6. Conducting cord
7. Rheostat
8. Long applicator
9. Suction tip
10. Biopsy forceps *
11. Inflating bulb

NOTE: * Sterile biopsy forceps is optional.

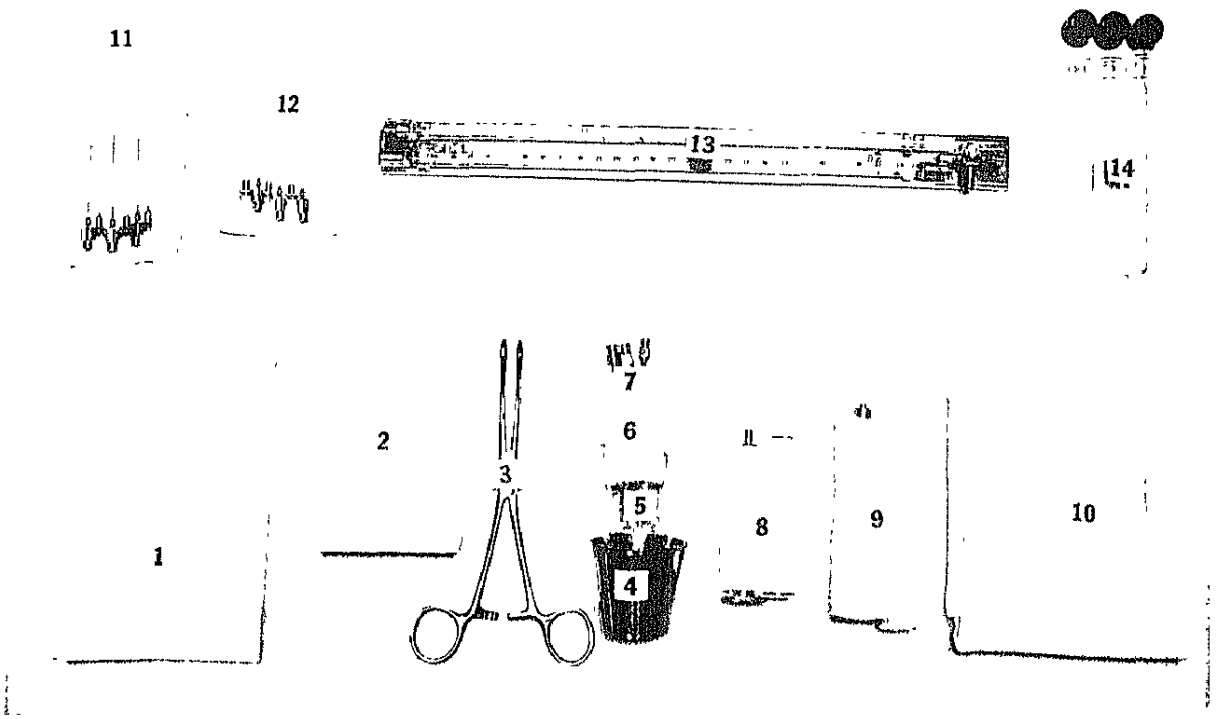


27. SALPINGOGRAM TRAY

Use: To inject a radiopaque dye so that the fallopian tubes may be visualized on X-ray.

1. Two towels
2. Vaginal speculum—medium
3. Sponges
4. Medicine glass
5. Syringe, 10 cc., luer lok with control
6. Uterine dressing forceps
7. Uterine tenaculum
8. Graduated uterine sound or probe
9. Uterine cannula with cones

SALPINGOGRAM TRAY CLOSED TRAY



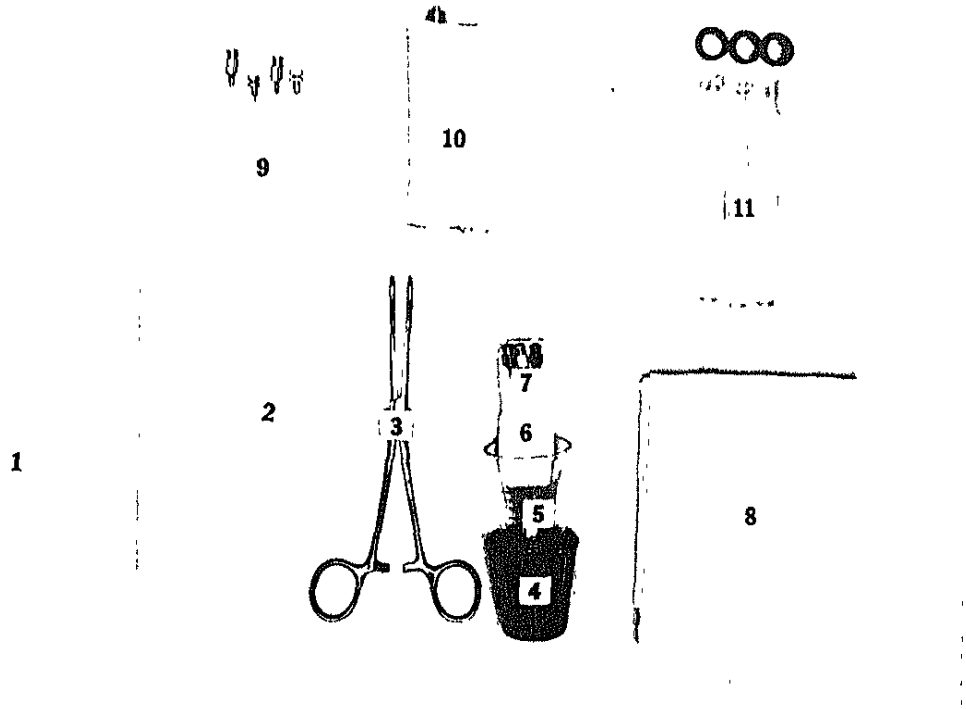
28. SPINAL TRAY (lumbar puncture)

Uses: To obtain specimen of fluid for analysis. To relieve intracranial pressure.

1. Two towels
2. Sponges
3. Sponge forceps
4. Solution cup
5. Medicine glass
6. Syringe, 2 cc., luer lok
7. Needles: 25G–⅝ inch; 22G–1½ inch
8. Syringe, 5 cc., luer lok
9. Syringe, 10 cc., luer lok
10. Drape sheet
11. Adult needles: 18G–3 inch; 20G–3 inch; 22G–3 inch
12. Pediatric needles: 20G–2 inch; 22G–1½ inch
13. Manometer with three-way stopcock
14. Three culture tubes with screw tops

NOTE: The above tray may also be used for Pneumoencephalography.

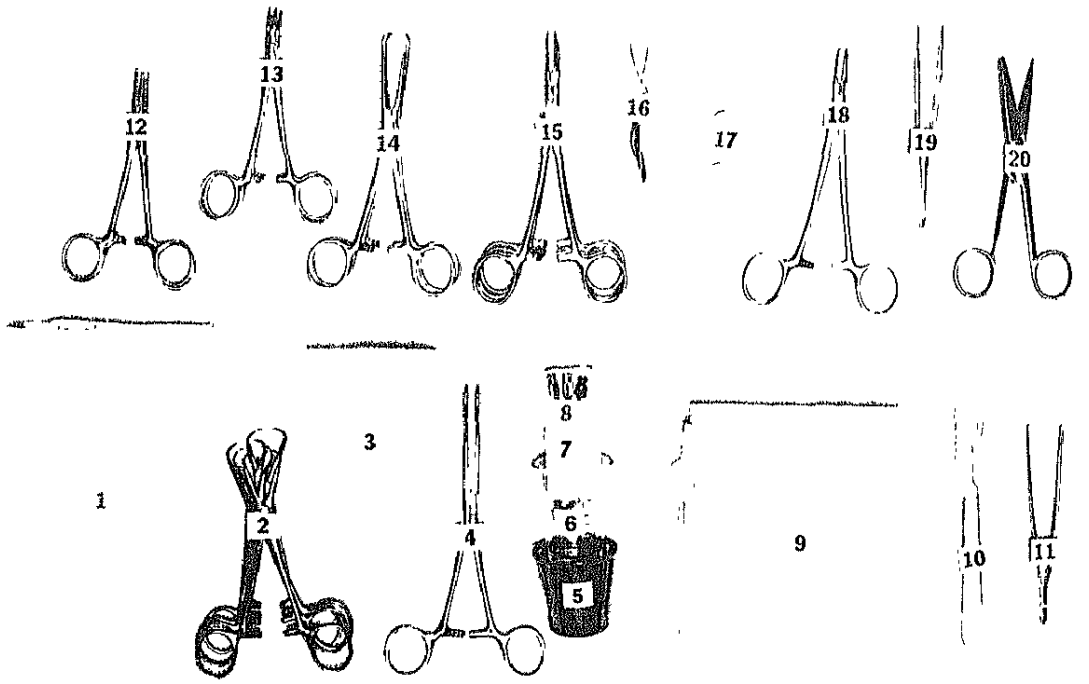
CLOSED TRAY



29. SUBDURAL TRAY

Uses: To determine whether there is an internal hydrocephalus. To relieve intracranial pressure.

1. Two towels
2. Sponges
3. Sponge forceps
4. Solution cup
5. Medicine glass
6. Syringe, 2 cc., luer lok
7. Needles: 25G–⅝ inch; 22G–1½ inch
8. Drape sheet
9. Two 20G–2 inch; short bevel spinal needles
10. Syringe, 10 cc., luer lok
11. Three culture tubes with screw tops

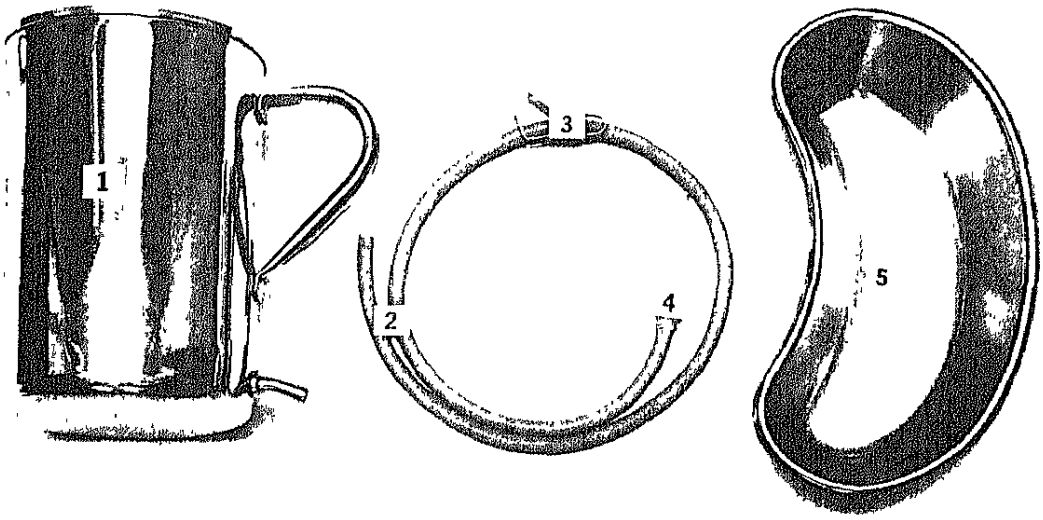


30. SUTURE TRAY (muscle biopsy; incision and drainage)

Uses: To repair a surgical laceration. To obtain a specimen of muscle tissue for diagnostic purposes. To incise a lesion to permit drainage.

1. Four towels
2. Four towel clips
3. Sponges
4. Sponge forceps
5. Solution cup
6. Medicine glass
7. Syringe, 2 cc., luer lok
8. Needles: 25G–⅝ inch; 22G–1½ inch
9. Drape sheet
10. Knife handle No. 3 with No. 15 blade
11. Thumb forceps
12. Two straight mosquito forceps
13. Two curved mosquito forceps
14. Two Allis forceps
15. Four small curved hemostats
16. Suture: silk or nylon
17. Suture needles
18. Needle holder
19. Tissue forceps
20. Suture scissors

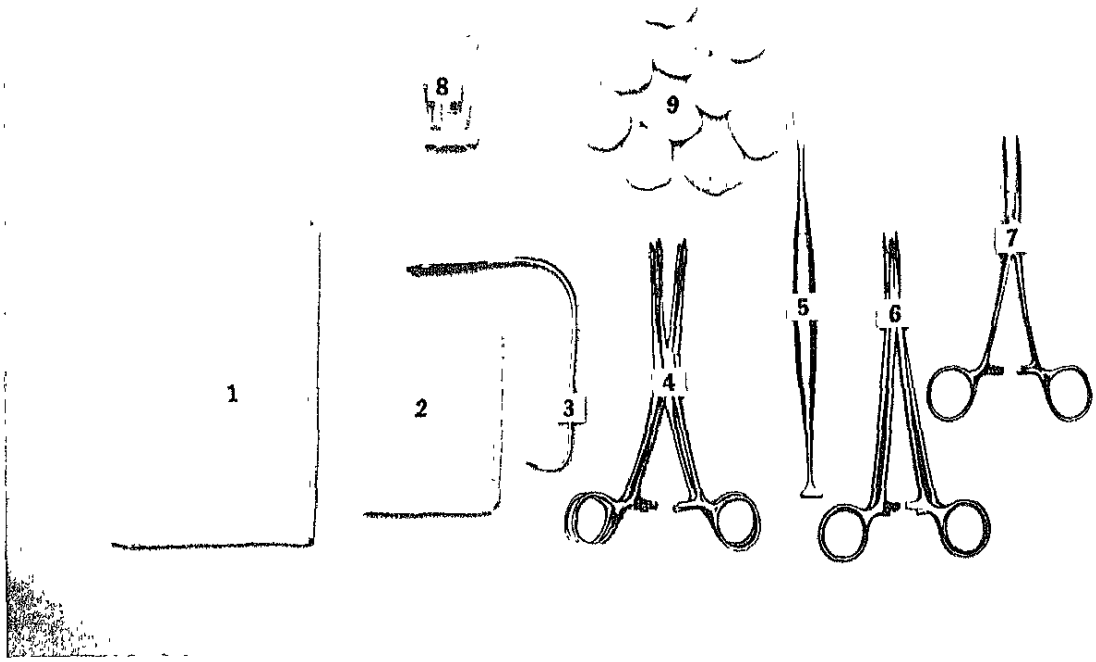
Variables: Commercially prepared sutures may be used. Culture tube and specimen jar may be dispensed with tray.



31. THROAT IRRIGATION SET

Uses: To relieve congestion, pain, and inflammation. To localize infection. To soften and remove exudate.

1. Irrigator can
2. Tubing
3. Clamp for tubing
4. Irrigating tip
5. Curved basin

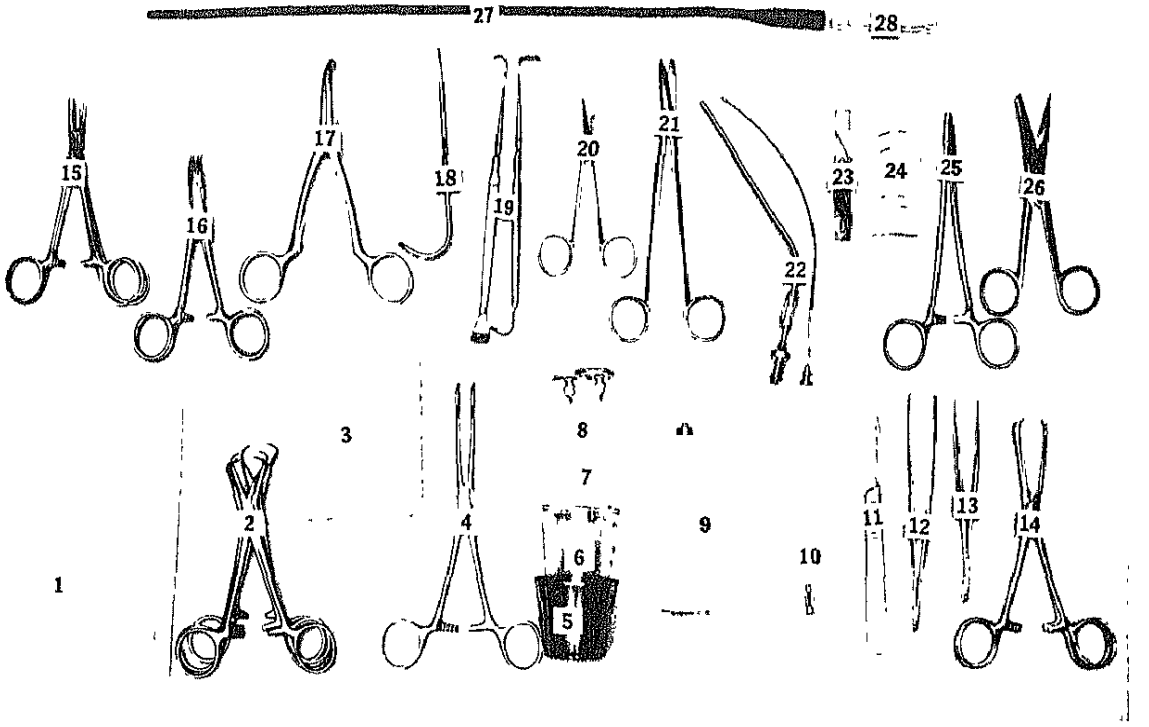


32. TONSIL HEMORRHAGE TRAY

Use: To control bleeding following surgery.

1. Two towels
2. Sponges
3. Tongue depressor
4. Two tonsil sponge forceps
5. Pillar retractor
6. Two curved tonsil hemostats
7. Medium curved hemostat
8. Medicine glass
9. Tonsil sponges

Variable: Tonsil needle holder and suture with atraumatic needle.



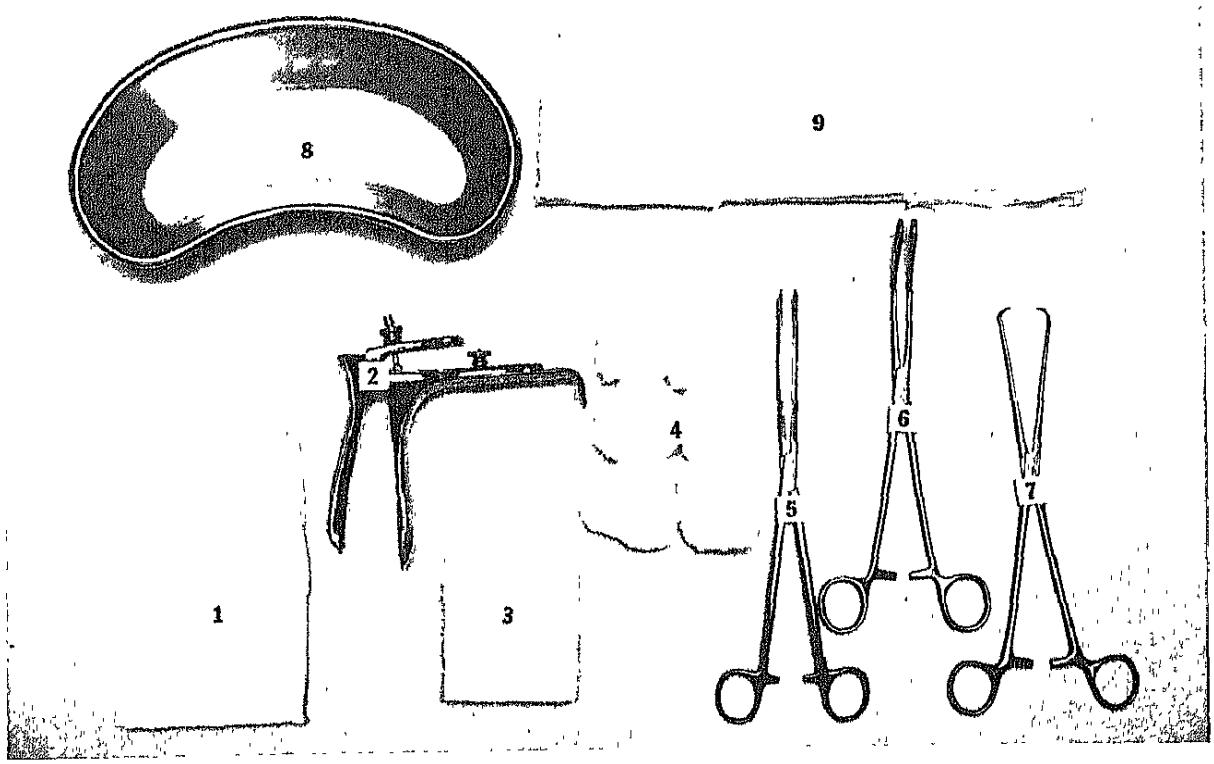
33. TRACHEOTOMY TRAY (tracheostomy)

Use: To provide an airway when patient is unable to breathe by making an incision and an opening into the trachea.

1. Four towels
2. Four towel clips
3. Sponges, gauze
4. Sponge forceps
5. Solution cup
6. Medicine glass
7. Syringe, 5 cc.
8. Needles: 25G–⅝ inch; 22G–1½ inch
9. Syringe, 10 cc.
10. Aspirating needle: 13G–3 inch
11. Knife handle No. 3 with No. 11 blade
12. Tissue forceps
13. Thumb forceps
14. Two Allis forceps
15. Three straight mosquito forceps
16. Three curved mosquito forceps
17. Tracheal dilator
18. Tracheal retractor hook
19. Two small retractors
20. Iris scissors, 3 inch, straight
21. Metzenbaum scissors, 7 inch, curved
22. One suction tip with obturator
23. Suture—silk 4–0
24. Suture needles No. 14 and No. 16 curved cutting
25. Needle holder
26. Suture scissors
27. Catheter—medium
28. Glass connector

NOTE: Tape to top of tray Nos. 4, 5, 6, and 7 tracheal tube (tape attached and individually wrapped) for adult; Nos. 0, 1, 2, and 3 for child. Dispense with suction apparatus which is provided with sterile tubing and connector.

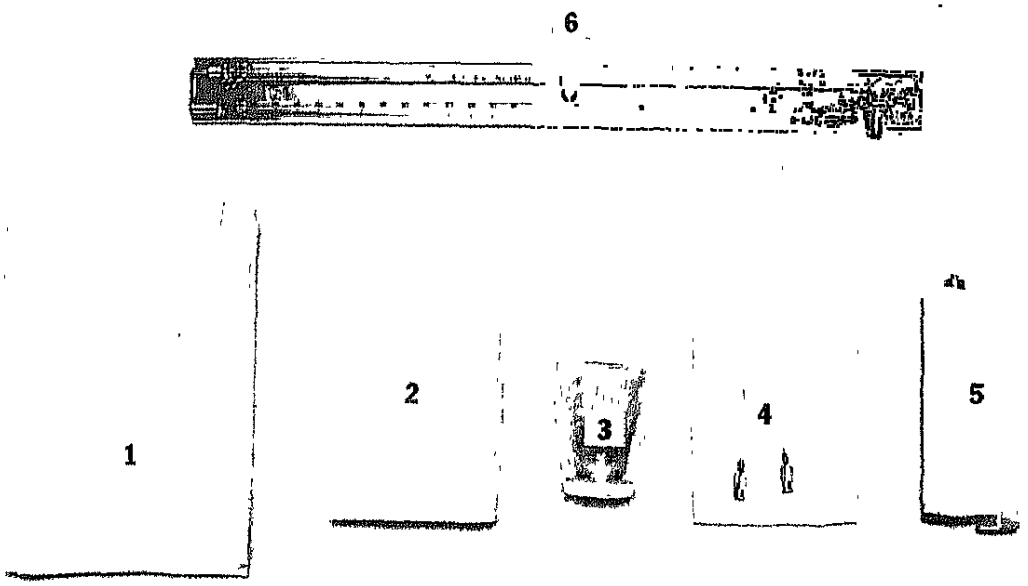
TRACHEOTOMY TRAY (tracheostomy) CLOSED TRAY



34. VAGINAL EXAMINATION TRAY

Use: To provide equipment for a sterile vaginal examination.

1. Towel
2. Medium vaginal speculum
3. Sponges
4. Large cotton balls
5. Uterine packing forceps
6. Large curved sponge forceps
7. Uterine tenaculum
8. Curved basin
9. Perineal pads

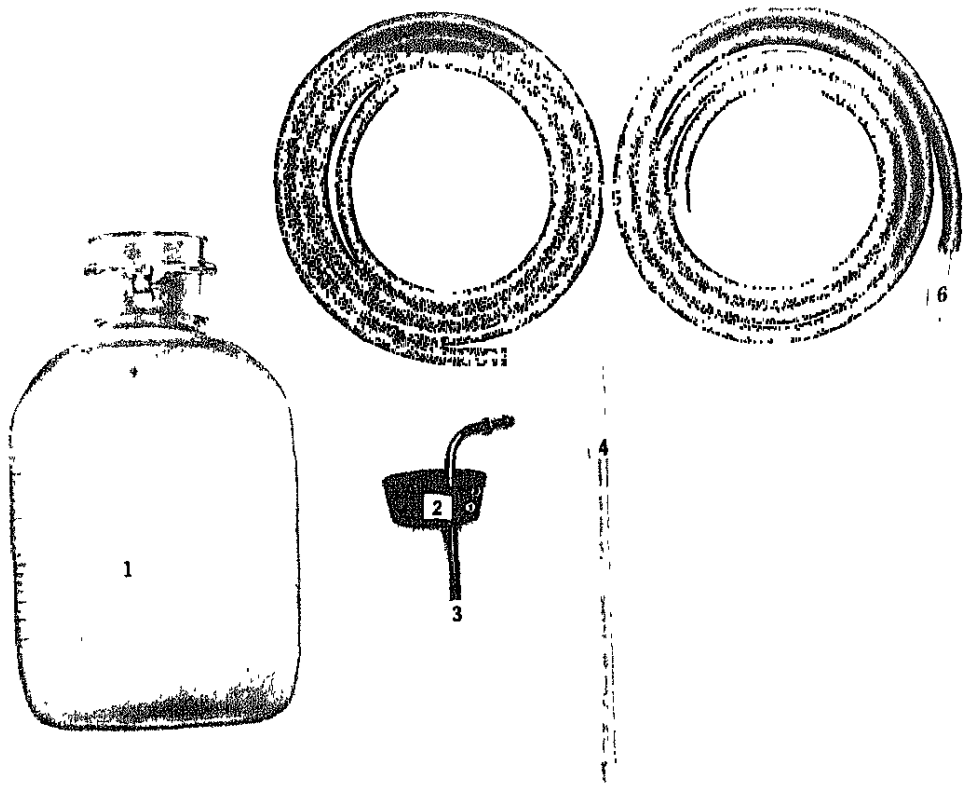


35. VENOUS PRESSURE TRAY

Use: To measure the pressure in the peripheral veins.

1. Two towels
2. Sponges
3. Medicine glass
4. Needles: 18G–1½ inch; 20G–1½ inch
5. Syringe, 10 cc luer lok
6. Manometer with three-way stopcock

VENOUS PRESSURE TRAY CLOSED TRAY



36. WATER SEAL DRAINAGE SET (closed chest drainage)

Use: To obtain pleural fluid by gravity, maintaining negative pressure in chest.

1. Graduated gallon jar
2. Double-hole hard rubber stopper
3. Right angle metal connector, 4 inches
4. Glass rod, 14 inches*
5. Two 60-inch lengths of tubing, $\frac{3}{16}$ x $\frac{3}{32}$ inch.
6. Glass connector

Variables: Nylon or plastic connectors may be used. Rack for holding gallon jar. Two hemostats.

*Moisten and insert plastic or glass rod in stopper before sterilization.

Surgical Supplies and Equipment Lists

The following lists of the supplies and equipment *required for various types of procedures are provided here for ready reference.

Supplies and Equipment for Lithotomy Surgical Procedures

Lithotomy Linen Pack

1 Wrapper (48 x 48 inches)
1 Table cover
2 Perineal pads
1 Lithotomy sheet
1 single sheet
10 Sponges (4 x 8 inches)
6 Drape towels (18 x 36 inches)
3 Gowns
3 Hand towels

Minor Basin Set

1 Wrapper (36 x 36 inches)
1 Large solution basin
1 Specimen basin
1 Suture basin

Preparation Set

1 Wrapper (20 x 20 inches)
2 Towels (18 x 36 inches)
2 Cotton tipped applicators
10 Sponges (4 x 4 inches)
2 Solution cups
1 Sponge forceps

Basic Diagnostic Instrument Set (Dilatation and Curettage)

1 Weighted vaginal speculum
1 Sims speculum
1 Eastman retractor
1 Jackson retractor
1 Sponge forceps
1 Uterine packing forceps
1 Uterine tenaculum
1 Vulsellum forceps
1 Set of uterine dilators
1 Goodell uterine dilator
3 Scissors: curved and straight Mayo, 1 suture
6 Curettes—3 dull and 3 sharp (2 each small, medium, and large)
2 Thumb forceps
3 Tissue forceps (1 Russian)
4 Allis forceps
4 Pean hemostats
4 Ochsner hemostats
1 Knife handle No. 4
2 Needle holders
6 Towel clips

Supplies and Equipment for Minor Surgical Procedures

Minor Linen Pack

1 Wrapper (48 x 48 inches)
1 Table cover
1 Double sheet
8 Towels (18 x 36 inches)
1 Single sheet
10 Sponges (4 x 8 inches)
1 Mayo stand cover
2 Gowns
2 Hand towels

Drape Sheet

Minor Basin Set

1 Wrapper (48 x 48 inches)
1 Large solution basin
1 Specimen basin
1 Suture basin

Preparation Set

1 Wrapper (20 x 20 inches)
2 Towels (18 x 36 inches)
2 Cotton-tipped applicators
10 Sponges
2 Solution cups
1 Sponge forceps

Basic Minor Instrument Set

2 Knife handles No. 3
4 Scissors: curved and straight Mayo, Metzenbaum, and Suture
2 Thumb forceps
4 Tissue forceps (6-inch Russian)
4 Needle holders: two 6-inch, two 7-inch
8 Towel clips
16 Small curved hemostats
4 Medium curved hemostats
6 Allis forceps

Retractors:

2 small Kelly
2 small Deaver
1 narrow ribbon
2 Army-Navy

*Trade names are provided as examples only and their inclusion does not imply endorsement by the Public Health Service or the U.S. Department of Health, Education, and Welfare.

Supplies and Equipment for Major Surgical Procedures

Basic Major Pack

1 Wrapper (60 x 60 inches)
1 Table Drape
12 Towels (18 x 36 inches)
20 Sponges (4 x 8 inches), radiopaque
10 Tape sponges, radiopaque
2 Single sheets
1 Mayo stand cover
2 Gowns
2 Hand towels

Nurse's Gown

1 Wrapper (36 x 36 inches)
1 Gown
1 Hand towel

Double Basin Set

1 Wrapper (48 x 48 inches)
2 Large basins
1 Specimen basin
1 Suture basin
1 Small round basin
1 Hand towel (between large basins)

Single Basin

1 Wrapper (36 x 36 inches)
1 Large basin

Preparation Set

1 Wrapper (20 x 20 inches)
2 Towels (18 x 36 inches)
2 Cotton-tipped applicators
2 Solution cups
10 Sponges (4 x 4 inches)
1 Sponge Forceps

Drape Sheet

Basic Laparotomy Instrument Set

3 Knife handles—No. 3, No. 4, No. 3–L
4 Scissors: straight and curved Mayo, Metzenbaum, and suture
2 Sponge forceps
2 Thumb forceps
7 Tissue forceps: two 6-inch, two 8-inch Russian, one Singley, two 1 x 2 teeth
5 Needle holders: one 6-inch, two 7-inch, two 8-inch
10 Towel clips
24 Curved Crile hemostats
6 Curved Pean hemostats
2 Babcock forceps
6 Allis forceps
2 Gall bladder forceps (right angle)

Retractors:

3 Ribbon: narrow, medium, wide
3 Deaver: narrow, medium, wide
2 Richardson-Eastman: small, large
2 Army-Navy
1 Balfour and blade

Supplies and Equipment for Normal Delivery

Basic Delivery Pack

1 Wrapper (48 x 48 inches)
1 Table cover
2 Perineal pads
1 Binder
1 Baby blanket
1 Single sheet
1 Double sheet
10 Sponges (4 x 8 inches)
2 Leggings (18 x 36 inches)
6 Towels
2 Gowns
2 Hand towels

Double Basin Set

1 Wrapper (48 x 48 inches)
2 Large basins
1 Placenta basin
1 Suture basin
1 Small round basin

Preparation Set

1 Wrapper (20 x 20 inches)
2 Towels (18 x 36 inches)
2 Solution cups
10 Sponges (4 x 4 inches)
1 Catheter (medium)
1 Sponge Forceps

Basic Delivery Instruments

6 Hemostats, large
4 Towel clips
1 Tissue forceps
1 Thumb forceps
2 Sponge forceps
2 Allis forceps
1 Needle holder, 8¼-inch
1 Vaginal retractor
1 Curved Mayo scissors, 6¾-inch
1 Straight Mayo scissors, 6¾-inch
1 Straight scissors, 5-inch
1 Cord clamp

Surgical Procedure Instruments

Cardiovascular Procedures

Aortic Graft—Basic major instrument set plus:

2 Pott's Smith tissue forceps
2 Patent Ductus clamps—straight, 8-inch
2 Patent Ductus clamps—angular, 7¾-inch
2 Bulldog clamps
2 Bainbridge vessel clamps
2 Thumb forceps—long, smooth, 10-inch
12 Crile hemostats
12 Mosquito hemostats
4 Pean, 8-inch hemostats
2 Gallbladder forceps
Suction tips—glass or plastic
1 Deaver retractor—medium
1 Metzenbaum scissors—long, curved, 9-inch
1 Metzenbaum scissors—long, straight, 9-inch
2 Self-retaining retractors (rake or spring)
1 Needle holder, 10-inch
2 Needle holders, 6-inch
6 Cord ties—long

Embolectomy—Same as aortic graft. Omit long tissue instruments.

Femoral Graft—Same as for aortic graft.

Portacaval Shunt—Basic major instrument set and pneumonectomy set plus:

2 Pott's Smith tissue forceps
2 Patent Ductus clamps—straight, 8-inch
2 Patent Ductus clamps—angular, 7¾-inch
2 Bulldog clamps
2 Bainbridge vessel clamps
2 Gallbladder forceps
2 Deaver retractors—narrow
2 Adson thumb forceps
1 Needle holder, 10-inch
2 Needle holders, 6-inch
2 Senn retractors
12 Mosquito hemostats
12 Crile hemostats, 6¼-inch
4 Pean, 8-inch hemostats
6 Cord ties, long

Laparotomy Procedures

Abdominal Hysterectomy—Basic major instrument set plus:

2 Tenaculums, single- and double-tooth
4 Pean, 8-inch hemostats
4 Ochsner 8-inch hemostats
4 Heaney clamps
2 Needle holders, 8-inch
1 Mayo scissors—curved, 9-inch
1 Mayo scissors—straight, 9-inch
1 Russian tissue forceps, 8-inch

Abdominal Perineal Resection—Basic major instrument set plus:

1 Metzenbaum scissors—long, curved
1 Metzenbaum scissors—long, straight
2 Thumb forceps, 10-inch
4 Allis forceps, 10-inch
2 Babcock, 9-inch forceps
4 Allen clamps
1 Glass rod
3 Anastomosis clamps
2 Rake retractors (pair)
2 Deaver retractors, small

If separate set of instruments is required for perineal resection, use basic minor set and rake retractors.

Cecostomy—Basic major instrument set plus:

4 Allis forceps, 10-inch
2 Babcock, 9-inch forceps
2 Doyen intestinal clamps—curved
2 Doyen intestinal clamps—straight

Cholecystectomy—Basic major instrument set plus:

2 Gallbladder forceps
1 Kelly retractor—large
1 Metzenbaum scissors—long, curved
1 Metzenbaum scissors—long, straight
1 Bake's dilators (set)
2 Common duct scoops
1 Randall's stone forceps—straight
1 Randall's stone forceps—medium curve
1 Trocar

Colectomy—Basic major instrument set plus:

1 Metzenbaum scissors—curved, 9-inch
1 Metzenbaum scissors—straight, 9-inch
2 Needle holders, 10-inch
2 Babcock forceps
4 Allis forceps, 10-inch
2 Ochsner, 8-inch hemostats
2 Doyen intestinal clamps—curved
2 Doyen intestinal clamps—straight
4 Allen clamps

Colostomy—Basic major instrument set plus: As for Cecostomy and include glass rod.

Diaphragmatic Herniorrhaphy—Basic major instrument set plus:

Chest approach:
Chest instruments
2 Ring forceps (sponge forceps)
2 Gallbladder forceps
4 Pean, 8-inch hemostats
2 Dressing forceps, 10-inch.
1 Metzenbaum scissors—long, curved
1 Metzenbaum scissors—long, straight
2 Needle holders, 10-inch
12 Crile hemostats, 6¼-inch
Abdominal approach:
1 Metzenbaum scissors—long, curved
1 Metzenbaum scissors—long, straight

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Laparotomy Procedures—Continued

Diaphragmatic Herniorrhaphy—Basic major instrument set plus—Continued
Abdominal approach—Continued
2 Dressing forceps, 10-inch
2 Gallbladder forceps
4 Allis forceps, 8-inch
4 Pean, 8-inch hemostats
2 Needle holders, 10-inch

Gastrectomy—Basic major set plus:
1 No. 3 knife handle
2 Needle holders, 7-inch
1 Metzenbaum scissors, 7-inch
1 Mayo scissors—straight
1 Metzenbaum scissors—curved, 9-inch
1 Metzenbaum scissors—straight, 9-inch
1 Needle holder, 10-inch
2 Dressing forceps, 10-inch
1 Nerve hook
4 Allis forceps
2 Babcock forceps
8 Mosquito hemostats
1 Payr clamp—large
1 Payr clamp—small
4 Allen clamps
2 Doyen intestinal clamps—curved, rubber shods
2 Doyen intestinal clamps—straight, rubber shods
2 McKenzie applying forceps and clips

Gastro-enterostomy—Same as for Gastrectomy, omit Payr clamps.

Gastrostomy—Same as for Cecostomy.

Ileostomy—Basic major instrument set plus: As for Cecostomy.

Liver Biopsy—Basic major instrument set.

Lysis of Adhesions—Basic major instrument set.

Pyloroplasty—Basic major instrument set. As for Gastrectomy Omit Payr clamps.

Ruptured Ectopic—Basic major instrument set.

Salpingectomy—Basic major instrument set.

Splenectomy—Basic major instrument set plus:
2 Dressing forceps, 10-inch
1 Metzenbaum scissors—curved, 9-inch
1 Metzenbaum scissors—straight, 9-inch
1 Needle holder, 10-inch
2 Gallbladder forceps
4 Pean, 8-inch hemostats

Sympathectomy—Basic major instrument set plus:
2 Thumb forceps—long, smooth, 10-inch
1 Metzenbaum scissors—curved, 9-inch
1 Metzenbaum scissors—straight, 9-inch
1 Deaver retractor—narrow
1 Deaver retractor—medium
2 McKenzie clip-applying forceps and clips

Uterine Suspension—Basic major instrument set.

Lithotomy Procedures

Amputation of Cervix—Basic minor and diagnostic instrument sets plus:
6 Allis forceps, 6-inch
4 Ochsner, 8-inch hemostats
6 Ochsner, 6-inch hemostats
4 Heaney forceps
Omit:
Army-Navy retractors
Kelly retractor
Dilators
Curettes

Anterior and Posterior Repair—Basic minor and diagnostic instrument sets plus:
4 Allis clamps
4 Ochsner, 6-inch hemostats
Omit:
Army-Navy retractors
Kelly retractor
Dilators
Curettes
N.B. Must include—
2 Deaver retractors—small
1 Ribbon retractor—narrow

Bartholin Cyst—Same as for anterior and posterior repair.

Marshall Marchetti—Basic major instrument set plus:
1 Needle holder, 10-inch
2 Dressing forceps, 10-inch
1 Metzenbaum scissors—curved, 9-inch
1 Metzenbaum scissors—straight, 9-inch

Vaginal Hysterectomy—Same as for amputation of cervix.

Vaginal Plasty—Same as for anterior and posterior repair.

Shirodkar Operation (for incompetent cervix)—Basic diagnostic instrument set plus:
4 Sponge-holding forceps
1 Needle holder, 8-inch
1 Mayo scissors—straight
1 Mayor scissors—curved
1 Russian, 8-inch forceps
2 Deaver retractors—small
1 Deaver retractor—long, narrow
4 Allis forceps

Neck, Chest, Extremity Procedures

Adrenalectomy—Basic major instrument set plus:
2 Dressing forceps, 10-inch
1 Metzenbaum scissors—curved, 9-inch
1 Metzenbaum scissors—straight, 9-inch
2 Gallbladder forceps
2 Needle holders, 10-inch
4 Pean, 8-inch hemostats
2 Deaver retractors—narrow

Neck, Chest, Extremity Procedures—Continued

Amputation—AK or BK—Basic minor instrument set plus:

1 Amputating knife
Saw
2 Gigli saws and handles
2 Bone curettes
1 Rongeur forceps
1 Bone cutter
1 Rasp
12 Crile hemostats, 6¼-inch
4 Pean, hemostats, 6¼-inch
4 Ochsner, 6-inch hemostats
2 Rake retractors—medium

Breast Biopsy—Basic minor instrument set plus:

2 Lahey goiter forceps, 6¼-inch
2 Senn retractors
2 Rake retractors—medium

Hydrocelectomy: (Adult)—Basic minor instrument set
(Child)—Basic minor instrument set plus:

2 Needle holders, fine tip
2 Retractors, small
2 Adson thumb forceps
2 Self-retaining retractors—small
10 Mosquito hemostats

Radical Mastectomy—Basic major instrument set plus:

12 Crile hemostats
4 Allis forceps
4 Lahey goiter forceps
8 Mosquito hemostats
2 Vein retractors
2 Skin hooks
2 Rake retractors—medium
2 Rake retractors—large

Omit: Large abdominal retractors.

Radical Neck Dissection—Basic minor instrument set plus:

1 No. 3 knife handle
1 Russian thumb forceps, 8-inch
2 Adson tissue forceps
18 Crile hemostats, 6¼-inch
12 Mosquito hemostats
2 Ochsner, 6-inch hemostats
4 Ochsner, 8-inch hemostats
4 Allis forceps
4 Babcock forceps
4 Pean, 8-inch hemostats
4 Gallbladder forceps
2 Skin hooks
2 Suction tips—small
2 Parker retractors
6 Towel clips
2 Retractors, fine
2 Rake retractors—small
2 Rake retractors—medium
1 Tongue depressor
1 Denhardt mouth gag

Basic Laparotomy set may be used—omit abdominal retractors, and add accordingly.

Bone dissection add:

1 Rongeur forceps
1 Bone cutter
1 Periosteal elevator
2 Gigli saws and handles
2 Chisels—small
2 Osteotomes—small

Ramstedt or Pyloromyotomy—Basic minor instrument set plus:

12 Mosquito hemostats
2 Vein retractors
2 Needle holders, 6-inch
1 Light dissecting scissors, 5½-inch
2 Pylorus separators

Scalene Node Biopsy—Basic minor instrument set plus:

2 Gallbladder forceps
6 Mosquito hemostats
2 Vein retractors

Thyroidectomy—Basic minor instrument set plus:

18 Crile hemostats, 6¼-inch
4 Lahey goiter clamps
4 Allis forceps
4 Ochsner, 8-inch hemostats
2 Gallbladder forceps
8 Mosquito hemostats
1 Thyroid self-retaining retractor
1 Russian tissue forceps, 8-inch
2 Adson tissue forceps

Thyroglossal Cyst—Same as for Thyroidectomy.

Orchiectomy—Basic minor instrument set.

Vein Ligation and Stripping—Basic minor instrument set plus:

2 Adson tissue forceps
2 Gallbladder forceps
8 Mosquito hemostats
2 Self-retaining rake or spring retractors
2 Vein strippers

Rectal Procedures

Anal Plasty—Basic minor instrument set plus:

2 Rectal retractors
3 Probes
4 Pennington forceps
Omit abdominal retractors

Fistulectomy—Same as for anal plasty.

Hemorrhoidectomy—Same as for anal plasty.

Thoracic Procedures

Pneumonectomy—Basic major instrument set plus:

1 Metzenbaum scissors—curved, 9-inch
1 Metzenbaum scissors—straight, 9-inch
2 Dressing forceps, 10-inch
2 Needle holders, 8-inch
12 Crile hemostats

Thoracic Procedures—Continued

Pneumonectomy—Basic major instrument set plus—Continued
4 Ring forceps (sponge forceps)
4 Gallbladder forceps
4 Tonsil hemostats
4 Pean, 8-inch hemostats
1 Richardson-Eastman retractor
Chest instruments
1 Rib spreader
1 Rib approximator
1 Rib shears
1 Matson rib stripper and elevator
1 Alexander costal periosteotome
1 Duval lung forceps
1 Rongeur forceps

Thorocoplasty—Same as above.

Thorocotomy—Same as above.

Urology Procedures

Cystostomy—Basic major instrument set.

Nephrectomy—Basic major instrument set plus:
2 Pedicle clamps
2 Dressing forceps, 10-inch
2 Pean, 8-inch hemostats
1 Deaver retractor—narrow
1 Deaver retractor—medium
2 Metzenbaum scissors—straight and curved, 9-inch

Supra-pubic Prostatectomy—Basic major instrument set plus:
Bladder retractor
2 Pean, 8-inch hemostats
2 Metzenbaum scissors—straight and curved, 9-inch
2 Dressing forceps, 10-inch
2 Needle holders, 8-inch

Miscellaneous Procedures

Hand Surgery—Basic minor instrument set plus:
2 Special hand-dissecting scissors
2 Plastic or vein retractors
2 Skin hooks
2 Needle holders, 6-inch
12 Mosquito hemostats
2 Adson tissue forceps
2 Senn retractors—small

Debridement and Skin Graft—Same as for hand surgery plus: Dermatome and blades.

Tendon Transplant and Lengthening—Same as for hand surgery.

Hip Nailing—Basic minor instrument set plus:
1 Richardson-Eastman retractor
2 Rake retractors—large
6 Towel clips
6 Crile hemostats

Chapter VII

STERILE LINEN PROCESSING

General Considerations

There are many advantages in processing sterile linen supplies in one area. The primary one is the release of nursing personnel for patient care. Other specific advantages are: (1) standardization of linen supplies, (2) added available space to specialty area, (3) greater economy of time and labor, (4) better housekeeping in the surgical suite and the labor-delivery areas, as the problem of lint is controlled, (5) better work production (especially in a large scale operation), (6) a more efficient check on the replacement of linen, and (7) simplification of the laundry operation.

In the planning stage for sterile linen processing, a committee should be formed of members who represent departments directly affected by sterile linen service. These departments are: Purchasing, Laundry, Surgical Suite, Labor-Delivery Unit, and the CMSSS. Representatives from Administration and Nursing Service should also be members of the committee. The purpose of the committee is to set standards and recommend procedures that would benefit the entire hospital.

The existing available facilities of each hospital are frequently the deciding factors in choosing the best answers to many questions that arise regarding the processing of linen. Some of these are:

- Should the linen be laundered by the hospital or a commercial laundry?
- Should essential sterile linen packs be assembled in the laundry or in the Central Service area?
- Should laundry personnel assemble the packs or should the CMSSS personnel assemble them in the laundry?
- Should drape sheets and towels be purchased or be made by hospital personnel?
- Should linen drapes be replaced by disposable drapes?
- Should linen wrappers be replaced by paper wrappers?

It is recommended that sterile linen be processed in the laundry. This includes inspecting, folding, assembling, and wrapping of packs. Ordinarily the packs are then sterilized in CMSSS. However, if the hospital has made provisions for a sterilizer in the laundry, assembled packs may be sterilized there under proper supervision.

References to linen apply to the broad definition of the term. The most practical material for general hospital use is 140 thread count muslin. Whether the muslin is bleached or unbleached depends upon the area in which it is used. Bed sheets are generally bleached. Most sterile linen is unbleached or dyed. Colored sheets or drapes are widely used in the specialty areas. Color absorbs the light and thereby reduces the glare reflected from the surgical lights.

All linens approved by the committee are cataloged according to:

1. Category_____ Gown.
2. Name_____ Surgical.
3. Fabric_____ Muslin.
4. Style_____ Raglan sleeve.
5. Color_____ Misty green.
6. Size_____ Extra large.

Before establishing a set of linen requirements, make an estimate of the necessary linen. This is especially essential in the processing of sterile linen packs.

Suggested basic packs to be kept in circulation:

1. One set in use.
2. One set in reserve in the specialty area.
3. One set in the laundry.
4. One set being processed in the department.
5. One set in CMSSS sterile storage.

If linen is processed by a commercial laundry, add one extra set for each day the linen is out of the hospital.

Preparation of Sterile Linen

Inspection.—All linen that is used for sterile supplies must be inspected over an illuminated work table for tears, pinholes, and other defects. The holes are encircled with pencil and the articles sent to the sewing room where they should be repaired with thermo-type patching equipment.

Folding.—A simple fold for all like articles is an aid in the standardization of linen. There is no logical reason why three areas using the same type of towel require three different methods of folding. A simplified method of folding is the fold in half, right over left, and left over right. This method produces folded linen of a more uniform size. Folding of the linen should be so designed as to save time for the person using the sterile linen as well as the person folding. Inspected and folded linen is sorted and stacked on shelves, according to use in the assembling of linen.

Assembly.—The packs should be so designed that the item to be used first in the sterile area is the last item to be placed on the pack.

- The linen should be so arranged that the alternate layers of linen are crossed to promote free circulation of steam during sterilization.
- Sponges should be located in the center of the pack to break up the close contact between more closely woven fabrics.
- Basins and trays should not be included in the pack, as they interfere with steam permeation and retard drying.
- The largest pack should not exceed 12 x 12 x 20 inches and should not weigh more than 10 to 12 pounds. If more material is necessary for the procedure the pack should be divided into two packs.
- The wrapper should provide protection against contact contamination as well as serve as an effective dust filter.
- The wrapper should not be drawn up too tight, just enough to hold the material together.

Wrapping.—All wrappers should be freshly laundered to reduce the possibility of superheating the material during sterilization, which rots the fabric. The choice of size of wrapper is important. The wrapper must be large enough to completely enclose the items. All pack wrappers should be large enough to cover the "sterile" table and to extend at least 6 inches below the edge on all sides.

There are two basic types of folds: (1) the square fold is used for large packs, and (2) the envelope fold is used for smaller items.

Packs may be secured with tape or twine. Pins should never be used. Pressure-sensitive tape is available and convenient to use. There are also several types of self-sealing packages available for smaller items.

Dating and labeling.—Dating is a requisite to comply with the safety margin storage life. It also aids in the rotation of supplies and stock control. An expiration date which is 30 days from day of sterilization should be used.

All packs and items should be clearly labeled. Commercial pressure-sensitive labels are available and convenient to use.

The wrapper and table cover used on linen packs should be large enough to allow at least 6 inches overhang on all four sides of the table. Wrappers for large items should be of muslin, 140 thread count and of double thickness. Paper wrappers may be used for small items. (See table 1 for suggested sizes.)

Table 1. Suggested Wrapper Sizes and Their Uses

Size (inches)	*Use*
12 x 12	For wrapping small items.
22 x 22	For wrapping gloves.
10 x 20	For single thickness for inner glove wrapper.
30 x 30	For wrapping treatment trays.
30 x 30	For wrapping basin sets.
48 x 48	For wrapping small linen packs.
60 x 60	For wrapping large linen packs for major surgery.

NOTE: Drape sheets are not included for two reasons: (1) to reduce the density of the pack, and (2) to increase the flexibility of the pack.

Contents of Sterile Linen Packs

The following are examples of basic packs:

Basic Major Pack for Surgical Suite

1 Wrapper
1 Table cover
12 Towels
20 Sponges, radiopaque
10 Tape sponges, radiopaque
2 Single sheets
1 Mayo stand cover
2 Gowns
2 Hand towels

Basic Minor Pack for Surgical Suite

1 Wrapper
1 Table cover
1 Double sheet
8 Towels
1 Single sheet
10 Sponges, radiopaque
1 Mayo stand cover
2 Gowns
2 Hand towels

Basic Gown Pack

1 Wrapper
4 Gowns
4 Hand towels

Basic Delivery Pack

1 Wrapper
1 Table cover
2 Sanitary pads
1 Binder
1 Baby blanket
1 Single sheet
1 Double sheet
10 Sponges
2 Leggings
1 Double sheet
6 Towels
2 Gowns
2 Hand towels

Figure 7 is an example of a basic major pack.

The nurse's gown should be wrapped as follows:

1 Wrapper—double thickness muslin
1 Gown—nurse
1 Towel—hand

The patient's drape sheet should be wrapped individually.

1 Wrapper—double thickness muslin
1 Sheet—to drape patient (pattern may vary according to type of incision).

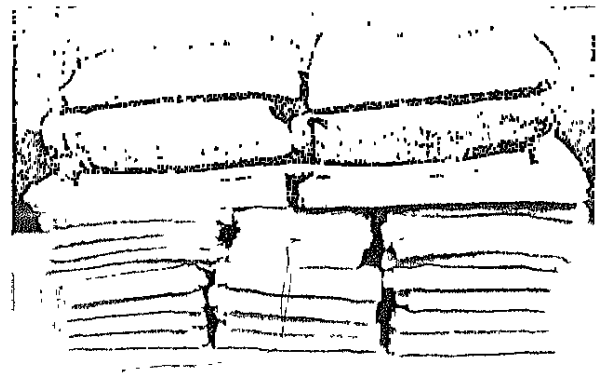

Figure 7. Basic Pack for Major Surgical Procedure.

Linen is assembled for packs in the manner of use. The last item to be used is generally at the bottom of the pack. Figure 8 is an illustration of a pack properly wrapped.

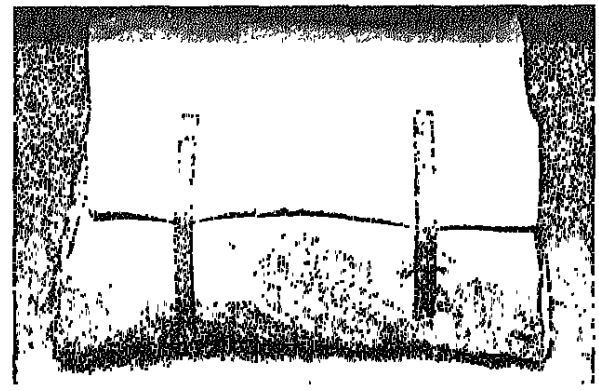

Figure 8. Linen Pack Properly Wrapped.

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Chapter VIII

CHEMICAL DISINFECTION

General Considerations

The term "disinfectant" may be defined as the physical or chemical means to remove or reduce the capacity of microorganisms to produce disease. Boiling water and flowing steam are two physical means of disinfection. They are not too practical for general hospital procedures. Chemical means are commonly used and are more effective.

Chemicals are used to destroy disease-producing and other harmful organisms, but they do not destroy most viruses or resistant bacterial spores. CHEMICALS DISINFECT—THEY DO NOT STERILIZE. Disinfection of floors, furniture, and portable equipment by chemicals render these reasonably safe to use. Although chemicals are widely used, they have many limitations and should be used as directed. It is necessary to clean the item before disinfecting. The effectiveness of chemical disinfection depends upon (1) the type and number of microorganisms present, (2) the chemical used, (3) its concentration, and (4) the exposure time of the chemical upon the microorganisms.

All areas in the hospital that are directly related to patient care are disinfected daily by chemicals in the cleaning solution. This procedure tends to reduce and destroy most types of microorganisms. When the patient is discharged, the equipment used is returned to the department for terminal sterilization or disinfection.

Principles

The following principles of chemical disinfection must be observed:

1. All items to be disinfected must be clean. (Organic soil such as blood, feces, and tissue inactivates the chemical.)

2. The exposure time must be adequate. (The degree of contamination determines the length of time of disinfection.)

3. The strength of the solution must be lethal for microorganisms. (The concentration of the chemical influences the germicidal effect.)

The effective use of a chemical disinfectant depends on other factors, which include:

- The disinfectant should be safe to handle.
- The disinfectant should not be injurious to the item disinfected.
- The disinfectant that may be good for one item may not be suitable for another.
- For practical purposes the disinfectant should be economical.

The preferred practice of chemical disinfection is based on the selection of the best available chemical for each use in the most effective way. To do this one must be aware of the nature of contamination, the major principles of chemical disinfection, and the properties of available germicides. When considering a disinfectant one should: (1) select a product known to be reliable, (2) consider the advertising claims critically, and (3) compare the action of the principle ingredient with a known prototype. The certainty of the effectiveness of any disinfectant can only be ascertained by in-use laboratory controlled testing of a specific compound under the conditions prevailing in the hospital.

Uses of Chemical Disinfectants

Alcohol—70 to 90 percent.—Vegetative forms of microorganisms and the tubercle bacilli are readily destroyed in this concentration. Any concentration lower than 70 percent by weight or 80 percent by volume is inadequate as a disinfectant. The alcohols, ethyl or isopropyl, are readily obtainable, safe to use, and relatively inexpensive. They act quickly, have a cleansing action, and leave no residue.

Chlorine.—Inorganic chlorine is a valuable disinfectant of water. The chlorine compounds have germicidal effects upon bacteria and viruses and are used to disinfect floors and lavatories.

Formaldehyde.—An aqueous solution containing about 37 percent by weight of formaldehyde gas is known as formalin 40 percent. Its irritating fumes limit its usefulness in CMSSS. Formalin has been used in the past to preserve catgut sutures and in the gaseous form to disinfect cystoscopes. *A combination of formalin and alcohol* has been used for years to disinfect knife blades, sharp instruments, and transfer forceps but this method, although effective, has fallen into disuse because of the toxic and irritating fumes.

Glutaraldehyde.—This is a chemical similar to formaldehyde and more active in a 2 percent aqueous concentration. It is a high level aqueous disinfectant and recommended for cystoscopes and other lensed instruments. Spores are destroyed in 3 hours, and it is tuberculocidal within 20 minutes.

Hexachlorophene.—This chemical is an antiseptic and most effective when combined with soap. It is used as a hand scrub for all hospital personnel and particularly recommended as a general skin cleansing agent in the nursery and as a preoperative skin preparation for surgery. It is frequently referred to as G–11.

Iodine-alcohol combination.—This combination increases the effectiveness of the two substances both in the length of exposure time and the number of bacteria killed.

- It is highly recommended as a skin disinfectant. The friction in application also enhances the action.
- It is effective for the disinfection of thermometers when 70 percent alcohol and 0.5 to 1 percent iodine in combination are used for 10 minutes.

Phenolic derivatives have been used for years but synthetic phenols have been recently put into use. They have generally the same advantages as phenols without the disadvantages. They are odorless and have low toxicity. They are not generally sporicidal but are active against gram negative bacteria. They have many uses:

- Instruments, needles, and syringes.
- Floors, walls, and furniture.
- Dishes and utensils.

Quaternary ammonium compounds.—This group of compounds has been used extensively in hospitals for disinfection. They are effective in destroying some vegetative microorganisms but have virtually no value for gram negative microorganisms. They are highly stable and nonirritating when used as recommended. They *do not destroy* the tubercle bacilli, are not sporicidal, and do not inactivate viruses. Limitations of use include:

- Neutralized by soaps or oils,
- Absorbed by gauze and fabrics.

Soap and detergents interfere with the germicidal activity of these disinfectants; so items must be thoroughly rinsed before being disinfected in the quaternary ammonium compounds.

Table 2 indicates general usefulness and effectiveness of chemical disinfectants.

Table 2.—Chemical Disinfectants

Chemical in solution	General usefulness	Effectiveness against		Comment
		TBC	Spores	
Alcohol—70 to 90 percent	Good	Very good	None	Volatile.
Chlorine compounds—4 to 5 percent	Good	Fair	Fair	Corrosive.
Formaldehyde	Fair	Good	Fair	Toxic—irritating fumes.
Formaldehyde-alcohol combination	Good	Very good	Good	Toxic—irritating fumes.
Glutaraldehyde	Good	Good	Good	Unstable—corrodes metal on 24 hours' exposure.
Hexachlorophene	Fair	None	None	Slow acting.
Iodine-alcohol combination	Fair	Very good	None	Stains fabrics.
Iodine and iodophors	Good	Good	Poor	Stains—corrosive.
Mercurial compounds	None	None	None	Bland.
Phenolic compounds	Good	Good	Poor	Bad odor—irritating, toxic.
Quaternary ammonium compounds	Good	None	None	Absorbed by fabrics.

Source: See Reference 9, Chapter VIII.

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Chapter IX

STERILIZATION

General Considerations

One of the most important responsibilities of ersonnel in the CMSSS is to assure that equip- ient is being properly maintained and that sup- lies are properly sterilized. Lives depend on it. 'o discharge their responsibilities effectively, per- onnel should (1) have an understanding of the elationship of microbiology to disease, (2) know ie basic principles of sterilization, and (3) have thorough knowledge of and ability to apply roper methods of processing supplies and quipment.

The importance of properly processing supplies or the protection of patients and the safeguard- ig of personnel cannot be overemphasized. The afest method for the protection of personnel and he safeguarding of supplies should be used.

Sterilization may be defined as that established nd approved process by which all forms of micro- rganisms are destroyed. The three effective ieans that are available for the sterilizing of sup- lies and equipment are: saturated steam under ressure, ethylene oxide gas, and dry heat.

Boiling water, flowing steam, and chemicals may e used in emergency situations but are not recom- ended for general use in the modern hospital. The above are recognized as providing sanitation r disinfection processes, but not true sterilization.

Basic Principles of Sterilization

Since sterilization is essential for the destruction f all microorganisms, knowledge of the basic rinciples is necessary. These include:

- Articles used in a hospital should have properties which would not be adversely affected by sterilization.
- Articles to be sterilized must be free from all foreign substances to permit surface contact with the sterilizing agent.
- Articles should be assembled and positioned so that complete penetration of the sterilizing agent is possible.
- Prescribed time and temperature must be assigned and followed for complete destruction of all microorganisms.
- Sterilizers and sterilizing agents should be checked periodically for efficiency and accuracy.
- Cultures should be taken at least weekly of all types of sterile supplies.
- Sterilizers should be operated according to instructions of the manufacturer.

Since disease is spread by transmission of the pathogenic (disease-producing) organisms from one person to another, personnel should know the various routes by which these disease-producing organisms leave the body of the infected person and enter the body of another. With this knowledge they will be better able to adequately protect themselves and others through appropriate preventive measures. The three transmission methods are: direct, indirect, and droplet or airborne. Table 3 illustrates some examples of how disease may be spread.

The aim of sterilization is to destroy the spore-forming microorganisms. When this occurs, the less resistant types are also destroyed.

Two types of bacteria in the spore form are used to test the efficiency of the sterilization process. They are Bacillus subtilis and Bacillus stearothermophilus; though relatively harmless in themselves, they are very resistant to steam, gas and

Table 3.—Examples of How Disease May Be Spread

Mode of transmission	Source of disease	Microorganism	Disease
Direct contact (person to person)	1. Lesion	Bacteria	Syphilis.
	2. Excreta	Virus	Poliomyelitis.
Indirect contact (person to supplies—supplies to person).	1. Contaminated linen	Bacteria	Boil-local infection.
	2. Infected needle	Virus	Infectious hepatitis.
Airborne droplets (infected person to air—air to person).	1. Diseased lung	Bacteria	Tuberculosis.
	2. Infected nasopharynx	Virus	Common cold.

heat. They therefore are frequently used as controls for standard sterilizing procedures. Although Bacillus subtilis is commonly recognized as a resistant bacterial spore, it is much less resistant to saturated steam than Bacillus stearothermophilus. For this reason, the organism of choice in dry spore state is Bacillus stearothermophilus. It provides the proper factor of safety when used for testing the efficiency of the sterilization process. Controls will be discussed later.

Microbiology as Related to Disease

Microbiology is a science that studies all forms of microorganisms. The germ is an example of a living organism that is familiar to all. Germs are so small that they can be seen only through the powerful lens of a microscope, hence the names of microbes or microorganisms. There are many classifications of microorganisms. They are classed according to size, shape, staining properties, spore-forming aspects, and whether or not they produce disease.

The two divisions of microorganisms of prime interest to hospital workers are bacteria and viruses. In some forms these organisms produce disease and may be very resistant to destruction. Among the most difficult to destroy are bacterial spores. Spores usually produce a wall around their cell, which is very resistant to heat and requires prolonged exposure to high temperature and moisture for destruction. Spores, like seeds, can lie dormant almost indefinitely and again "sprout" or come to life under favorable conditions.

The human body has a normal resistance to disease, but when a person becomes ill or is overly tired, his resistance is lowered and an encounter with a microorganism at this time may result in disease or what is commonly referred to as an infection.

Methods of Sterilization

The item to be sterilized often determines the sterilization method to be used. The following methods are presented in the order of their efficiency and practicality. They are steam under pressure, gas, and dry heat.

STEAM UNDER PRESSURE

Saturated steam under pressure is the most reliable and most frequently used sterilization method. It is the most dependable method because of the ability of steam to penetrate and of heat to destroy microorganisms.

The mechanical device used for this method is commonly known as a *sterilizer* (see figure 9). This modern steam-under-pressure sterilizer is available in many sizes. It is a container designed to house items and to allow for their penetration with steam under pressure. In principle, it is essentially the same as a home pressure cooker with refinements to increase dependability, convenience, and safety.

Directions for operation and ordinary maintenance of the sterilizer should be included in the basic training of all departmental personnel. The operating manual should be readily available for all and consulted frequently.

Many improvements have been made in this type of sterilizer over the years. Some of them include: (1) double-shell (to prevent condensation on wall of inner chamber), (2) safety door (to prevent opening while sterilizer is pressurized), (3) safety valves (to prevent overpressure due to sterilizer malfunction), and (4) automatic timers.

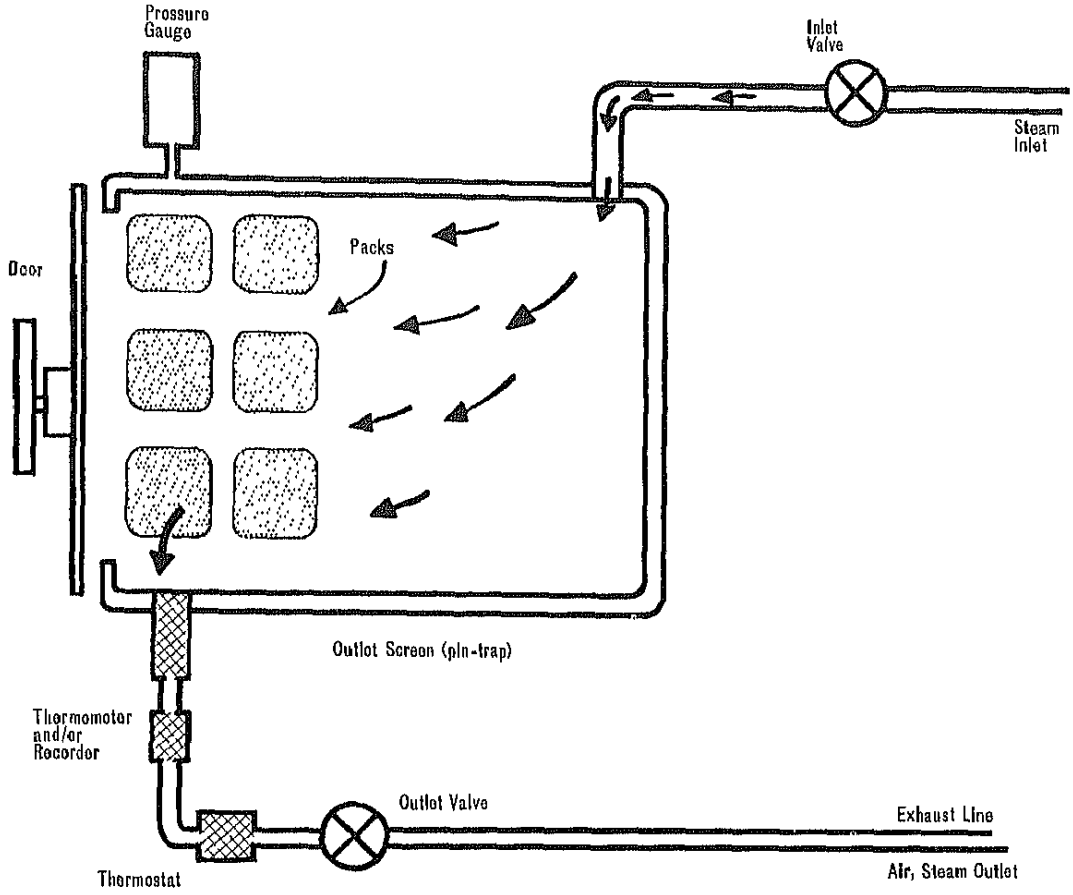

Figure 9. Simplified Diagram of a Sterilizer.

Impediments to Sterilization

Despite the many advantages of steam heat as a sterilizing agent, positive sterilization may be impeded by certain factors. The main impediment is the *presence of air* in the sterilizing chamber. If small amounts of air remain in the chamber, they will concentrate in pockets in the load and can be difficult to remove.

Procedural errors.—Other impediments may result from procedural errors. As professional responsibility and liability are increasing, it is essential that personnel recognize the following errors which may result in sterilizing failures:

1. *Overloading.*—Loose packing of the sterilizer is essential to allow free access of steam and escape of air. If all the air is not allowed to escape, an air-steam mixture will result in a lower temperature. Gages on the outside of the sterilizer may not record this error.

2. *Oversized or too-tight packs.*—Air elimination, which is essential, is difficult to achieve if packs are too large or wrapped too tightly. Since danger may not be detected by the external gage, pack preparation must be properly supervised.

3. *Improper operation.*—Examples of improper operation of the sterilizer include:

a. Neglecting to follow the manufacturer's direction.

b. Shortening the exposure time because of a rush order.

c. Failing to clean regularly the outlet screen and exhaust line.

d. Failing to have regular inspection and proper maintenance.

Other impediments.—Other conditions that may cause unsatisfactory sterilization are: Many sterilizers in use today are 20 to 40 years old and may

be obsolete, thereby having design limitations. Safety features may not be present on others.

As most personnel are not technically trained to repair and make major adjustments on sterilizers, the supervisor must insist on regular inspection and maintenance (preferably by a sterilizer specialist). She must also see that personnel carefully follow directions given in the sterilizer operating manual.

Sterilization Controls

Because of the many sources of possible sterilization failure, a system of controlling the sterilization process is essential. There are three types of controls:

1. *Mechanical.*—Manufacturers have supplied several devices to assist in identifying and preventing malfunction and operational errors. Among these are:

a. *A recording thermometer*, which gives a written report of the time and temperature of the loads processed. This may also serve as a permanent record.

b. *An indicating thermometer*, which points out the temperature at exhaust line.

2. *Biological.*—Most hospitals use the biological approach to sterilization control.

Culture tests are the best means of confirming the sterility of a particular article or evaluating the effectiveness of a sterilizer. They should be performed at least once weekly. Cultures must always be repeated after a sterilizer has been repaired.

Prepared cultures are preferable and should be placed in the densest part of the linen pack. Place the pack in the front bottom part of the sterilizer. These cultures may be obtained commercially in the form of dried bacterial spores on paper strips or in sealed ampules. After sterilization they are sent to the laboratory for incubation and report.

3. *Chemical controls or sterilizer indicators*—These controls detect cool air pockets at the center of load. Their limitations, however, should be recognized. These controls *do not prove sterilization;* only cultures that are used to test the sterilizer will prove sterilization if properly used. There are several types of indicators, including:

a. *A pellet* sealed in a small glass tube which is placed in the center of the pack. When conditions of time and temperature are favorable in the sterilizer, the pellet melts. This does not occur if a cool air pocket is present.

b. *A cardboard strip* impregnated with dye, which, when placed within the load, changes color when steam causes a chemical reaction in the dye.

c. *A sterilizer indicating tape*, which is useful to show that the pack or article has been in the sterilizer. This does not mean that the pack or article is necessarily sterile.

Procedures for Steam Under Pressure Sterilization

How to Prepare the Load

1. Fabric should be laundered between sterilizations. This prevents damaging of fabric due to excessive drying.

2. Limit the size and density of each pack. This insures complete steam permeation, and provides a liberal margin of safety (maximal size: 12 x 12 x 20 inches, maximal weight: 12 pounds).

3. Use double-thickness muslin (or equivalent) as wrapping material for surgical supplies. This provides protection after sterilization.

4. Wrappers must be permeable. Canvas *must never be used* as wrapping material.

How to Load the Sterilizer

1. Place all packs (linen, gloves, and the like) on edge, and arrange load in chamber so that only minimal resistance to passage of steam through the load will exist.[1]

2. Place jars, canisters, and all other nonporous containers of dry material on sides. This permits prompt displacement of air and quick contact of steam with all surfaces of containers and contents. Drying is also facilitated.

3. Place utensils and treatment trays on edge so they will dry properly.

4. Place instrument sets in trays having mesh or perforated bottoms flat on shelves to keep contents in order.

5. In loads combining fabrics and hard goods, place the hard goods on lowest shelves of loading

[1] NOTE: Gloves processed in a standard type sterilizer should be placed in upper two-thirds of chamber. In combined loads, the required time should be the maximum for items to be sterilized. However, it is better not to sterilize gloves or other rubber goods with items requiring a longer sterilization time.

car. This prevents wetting of fabric packs from condensate dripping from hard goods' surfaces.

6. Do not stack or nest plastic utensils.

7. Sterilize solutions separately from other supplies or materials.

8. Sterilize small items in wire mesh basket.

It is important to note that sterilizing conditions are based upon the temperature rather than pressure. Moist heat is the sterilizing agent. Pressure is only incidentally significant. Effective steam sterilization and time of exposure are measured from the moment the thermometer in the discharge line indicates a minimum temperature of 250° F. using steam under pressure in standard type hospital sterilizers. *The practice of measuring the sterilizing period from the time the pressure gage indicates 15 pounds, or perhaps 20 pounds, should be discontinued.* The pressure within the sterilizer is not indicative of positive sterilization because faulty air elimination, geographical altitude and other factors affect gage pressure within the sterilizer. The gage should not be relied upon. Employes should be taught to check the temperature gage on the exhaust line when checking sterilizer temperatures.

Table 4 indicates minimum exposure periods for sterilization of supplies.

Care of the Sterilizer

Daily: Remove the plug screen strainer and remove lint and sediment from the pores with a brush. It is through this screen that air and condensate pass and are removed from the chamber. If this detail is neglected the sterilizer cannot be depended upon for positive sterilization.

Weekly: The inside of the chamber should be washed with a mild detergent or special sterilizer cleaner at least once a week. Never use strong abrasives, steel wool, and the like. A long-handled cellulose sponge mop is helpful in cleaning the longer chambers. (Chamber should be cool before cleaning.) Remove plug screen, and flush chamber drain line with hot solution of trisodium phosphate (one ounce to one quart of hot water). This should be followed with a flush rinse of one quart of tapwater. Check gasket frequently for signs of wear.

Care of Carriage

Daily: All accessible surfaces should be washed with a mild detergent solution. Use a damp cloth, begin at top and work downwards. Casters should be cleaned last.

Table 4.—Minimum Exposure Periods for Sterilization of Supplies *

(Using Steam Under Pressure in Standard Type Hospital Sterilizers)

	250–254° F. (121°–123° C.) minutes	270° F. (132° C.) minutes
Brushes in dispensers, and/or individually wrapped cans	30	10
Dressings, wrapped in paper or muslin	30	10
Dressings, in canisters (on sides)	30	10
Flasked solutions		
75 ml.–250 ml	20	----------
500 ml.–1,000 ml.	30	----------
1,500 ml.–2,000 ml.	45	----------
Glassware empty, inverted	15	3
Instruments, metal only, any number	15	3
Instruments, metal combined with other materials	15	7
Instruments, metal only, in covered and/or padded tray	15	7
Instruments, metal combined with other materials, in covered and/or padded tray	20	10
Instruments, wrapped in double thickness muslin	20	10
Linen, packs, 12 x 12 x 20 inches or less	30	----------
Needles, individually packaged in glass tubes or paper (lumen moist)	30	10
Rubber gloves, wrapped in muslin or paper	20	----------
Rubber catheters, drains, tubing, etc., individually packaged in muslin or paper (lumen must be moist)	20	----------
Rubber catheters, drains, etc., unwrapped	20	10
Treatment trays, wrapped in muslin or paper	30	10
Utensils, unwrapped	15	3
Utensils, wrapped in muslin or paper	20	10
Syringes, unassembled, individually packaged in muslin or paper	30	10
Sutures, silk, cotton, or nylon, wrapped in paper or muslin	30	10

* Source: *Technique Manual.* American Sterilizer Company. Erie, Pa. 1965. 19 pp.

PREVACUUM AUTOMATIC STERILIZER

While steam under pressure is considered the most reliable sterilization method, it has certain limitations because of human or mechanical error. Research workers, striving for more efficient means of sterilization, realized that the possibility of entrapped air within the chamber was a constant hazard to positive sterilization. They were also aware of the dangers of human frailty in the packaging of supplies and the loading of the sterilizer, frequently resulting in ineffective sterilizing practices.

Great improvements have been made in the past few years. In the prevacuum automatic sterilizer, air is removed by a powerful vacuum pump which reduces the absolute pressure of air in the chamber before steam is admitted. This removal of air will compensate to some degree for the effects of human error in the packaging of supplies and in loading.

With this type of sterilizer the total sterilization time can be greatly reduced, a complete cycle taking as little as 20 minutes. The penetration time is shorter because, after an almost perfect vacuum has been drawn, steam permeates the load almost immediately. The sterilization cycle is greatly reduced by the shorter penetration period, higher temperature, and rapid exhaust and cooling time caused by the induced vacuum, and the holding and safety period are shortened by the increased temperature. The manufacturer's recommendations for the operation of the sterilizer should be carefully followed.

GAS STERILIZATION

Various gases have been used commercially for sterilization for many years. However, it is only recently that gas has been available for hospital use. This gas method of chemical sterilization is frequently referred to as "cold sterilization." Though this terminology may be misleading, it is understandable when the temperature of 120° F. to 140° F. used for gas sterilization is compared to the 250° F. to 270° F. of steam sterilization.

With the increased use of plastics and other synthetic products that could not be penetrated by steam or were destroyed by dry-heat sterilization, *liquid chemical disinfection* was the method commonly used. Gas sterilization, which is now available, is the recommended sterilizing method for such articles. Its effectiveness is based on the gas concentration present, proper humidity, temperature, and exposure period.

Since the advent of gas sterilization, several types of gas have become available. The gas most commonly used in hospitals, however, is ethylene oxide—a colorless gas which will blister the skin on contact. Because it is highly flammable, it is usually mixed with an inert gas that eliminates this undesirable characteristic and is used in a closed chamber. The sterilizer has automatic controls, which are set after loading, for the complete processing cycle. It is recommended that the sterilizer be located in a well-ventilated area, to aerate the sterilized items, especially rubber articles which absorb ethylene oxide.

Four factors affecting sterilization with ethylene oxide are humidity, temperature, concentration of gas, and exposure period.

Uses

This gas is used in hospitals to sterilize the following:

1. Articles that may be damaged by heat or moisture. Examples are plastic materials, cystoscopes, urethral catheters, anesthesia equipment, and electrical equipment.
2. Articles which may last longer when sterilized by gas. Examples are rubber gloves, catheters and tubings, and delicate surgical instruments.
3. Articles that are difficult to sterilize by other methods. Examples are mattresses, pillows, incubators, and bassinets.

Advantages

Gas sterilization offers the following advantages.

1. It is effective against all types of microorganisms.
2. It is easily obtainable.
3. It is noncorrosive and does not damage items.
4. It has the ability to easily penetrate through a mass of some dry materials.
5. High pressures are not necessary.

Disadvantages

The following disadvantages in the use of ethylene oxide have been observed:

1. It requires long-time exposure.
2. Compared with steam, it is expensive.
3. It is toxic, making it essential that supplies sterilized by this method be withheld from use un-

considered safe. (Some objects absorb gas uring sterilization and time must be allowed for ssipation of these gases.) Nonporous items re- ire only 4 hours. Items such as rubber gloves, oppers, and tubing require an estimated 24 to 48 ours for complete aeration. In addition, other ems require a much longer aeration period. ackaging materials should be selected carefully; r example, there are some plastics which are not itable for use as packaging materials.

ading of Sterilizer

erilizers Equipped With Shelves

1. All packaged items should be placed on the elves in a neat and orderly manner.

Caution: Do not stack packaged items too ghtly together. Always allow air space between ackages.

2. Prepackaged rubber gloves may be placed in ire baskets for sterilization.

3. Avoid contact of load components with the lls of the sterilizing chamber.

4. At least three inches of air space should be ovided between the chamber ceiling and the top- ost packages of the load.

NOTE: DO NOT REMOVE BOTTOM SHELF OF TERILIZER EXCEPT WHEN REQUIRED FOR LEANING PURPOSES.

erilizers Equipped With Loading Carriages

Follow the procedures stated above. Excep- on: Packaged rubber gloves may be stacked in ws from back to front on the carriage shelves. o not pack the rows too tightly. Provide space ween rows for circulation of the gaseous steri- ing agent.

irections for Operation

Sterilization by ethylene oxide is a complex ocess when compared to steam or dry heat. The ocess is dependent upon the proper blending of e gaseous mixture with the humidity, tempera- re, and exposure time. Other considerations ould include the resistance of the microorga- sms, the proper preparation, and the position of ems to be sterilized. Strict adherence to the anufacturer's instructions for operation should maintained. In regard to specific items such as stoscope and delicate instruments, consult with e manufacturer of these items for adverse effects resulting from gas sterilization. See table 5 for conditions required for sterilization by ethylene oxide mixtures.

Caution: All materials should be quarantined in a well-ventilated area for a minimum of 24 hours following sterilization.

It is essential that sterilization by ethylene oxide be performed by skilled personnel.

Care of Gas Sterilizer

After each cycle and before opening door: Determine functional efficiency of the sterilizer by examining the recording chart for deviations from data of previous cycles.

Daily:

1. Wipe chamber walls, shelves, and door with damp cloth.

2. Keep chamber drain line inlet (in combination steam-gas sterilizers) clean and dry.

Weekly:

1. Check oil-sealed vacuum pumps for oil loss (in glass reservoir). If oil level is less than one-half inch from bottom of reservoir, fresh oil is needed.

2. Check glass jar on effluent side of the pump. If water-oil mixture is observed, empty the jar and refill with fresh oil.

*Table 5.—Conditions Required for Sterilization by Ethylene Oxide Mixtures**

Concentration and exposure	450 milligrams/liter of chamber space for 5 hours minimum or 850 milligrams/liter for 3 hours minimum.
Temperature	120°–140° F. (depending on type of material).
Relative humidity	50–60 percent

*Source: *Technique Manual.* American Sterilizer Co., Erie, Pa. 1965. 19 pp.

STERILIZATION BY DRY HEAT

Certain materials cannot withstand or be penetrated by steam. For these, other sterilization methods have been developed. A safe method for hospital use is dry heat.

An oven-type sterilizer is used. It is similar to a home oven, but has a much more reliable temperature control. Heat is conveyed by the circula-

208-750 O—66——7

tion of hot air. The time required for sterilization is at least one hour at 320° F.

Comparison of Dry Heat to Steam

1. Dry heat requires higher temperatures to sterilize—about 320° F. compared to 250° F. for steam.

2. Dry heat requires a longer time for sterilization. At least one hour is required for easy-to-penetrate materials; more exposure time is required for other materials.

3. Dry heat is used when direct contact of saturated steam to all surfaces of the articles is impractical or unattainable. For example, materials and articles which should be sterilized by dry heat include anhydrous oils, powders, petroleum products, glassware, instruments which cannot be disassembled, and sharp instruments which might be damaged by moist heat.

Materials Sterilized by Dry Heat

1. *Powders.*—To assure sterilization of a slow-heating, compact substance such as powder, 2 hours at 320° F. are required for a 1-ounce container of powder.

2. *Oils*

a. Petroleum Jelly (Vaseline).—The required sterilizing time is 2 hours at 320° F. To provide adequate sterilization, petroleum jelly (vaseline) and oils should be limited to 1-ounce size.

b. Mineral oil, glycerine, and other oils.—Oils that are normally liquid at room temperature require sterilization for a period of 2 hours at 320°F. The quantity must be limited to 1 ounce.

c. Vaseline gauze.—Exposure time is 2½ hours at 320° F.

3. *Glassware.*—All items such as syringes, culture tubes, and flasks should be cleaned and dried thoroughly before wrapping for sterilization. Exposure time is one hour at 320° F.

4. *Cutting edge.*—Instruments which may be damaged by moist heat may be sterilized by dry heat. Exposure time should be one hour at 320° F.

Loading of Dry-Heat Sterilizers

1. Never load the chamber to the limit.

2. Allow some space between packaged articles and between baskets or containers of supplies.

3. Keep all articles well away from chamber sidewalls, so that the hot air may circulate freely.

Minimum Standards for Dry Heat Sterilization

Although there are many varying requirements for dry-heat sterilization, depending upon the characteristics of individual items, the following standard exposure conditions are suggested.*

340° F. for 1 hour
320° F. for 2 hours
300° F. for 2½ hours
285° F. for 3 hours
250° F. for 6 hours, or longer

These temperature-time recommendations include an allowance for temperature lag in the load during the initial part of the exposure period.

Care of Dry-Heat Sterilizers

Common sense rules apply in keeping the chamber clean at all times. Spilled materials should be removed before another cycle is started.

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Chapter X

STORAGE AND INVENTORY

General Considerations

The general acceptance and use of disposable items has influenced a change in the storage areas. Previously it had been necessary to have large amounts of supplies in sterile storage. The area for sterile storage was of considerable size while the bulk storage area was comparatively small. Manufacturers are now rapidly increasing the range of disposable products. This trend has decreased the amount of work in the cleaning and assembly areas but has increased the need for bulk storage. Cartons containing sterile disposable items are stored in bulk storage; these supplies are removed from cartons as needed and transferred to the sterile storage area. True, many of the disposable supplies are sterile but the cartons are not to be kept in sterile storage. Some hospitals dispense disposable supplies from general stores directly to using areas.

All storage areas should be dry and protected from moisture of condensation, high humidity, vermin, or insect excreta. Stock should be rotated so that it is current and paper wrappers do not age to the point of brittleness.

The closures of sterile items should be tamperproof and impossible to reseal. If there is a suspicion of an incomplete closure in a manufacturer's items the entire lot should be returned.

Supplies should be so wrapped that insects cannot find entry to sterile contents. This is an important point frequently overlooked.

Bulk Storage

The bulk storage area may contain a large variety of items. The standard amount of a specific item varies in each hospital. Aspects that influence the amount are: (1) service rendered to the department from general stores, (2) manufacturers' ability to meet the demands of the department, especially regarding disposable items, (3) the space available in bulk storage, and (4) the rate of usage of items stored. In each case it is important to keep ahead of the demand.

To maintain the inventory the use of preprinted forms simplifies the ordering of stock supplies from general stores. See figures 10–15 for sample forms, which include a partial listing of items. A form suited to the needs of the individual hospital should be developed. Although it should not be the supervisor's responsibility to keep the supply even with the demand, it is she who has to bear the brunt if the item is out of stock.

Cases or cartons should not be placed directly on the floor in the bulk storage area. They should be stacked on low lifts or platforms. Inventory of bulk supplies is simplified if similar items are stored in the same section. All sections should be identified and classified. Shelving is essential for the wide variety of small items. An overabundance of bulk storage can be a tremendous waste of space and money.

Sterile Storage

The handling, transportation and storage of sterile supplies are among the most important functions of the department. Emphasis has been placed on the importance of obtaining positive sterility. Achieving sterility is not sufficient, it must be maintained. This is the basic principle of sterile storage.

Figure 10.—General Stores Requisition for CMSSS: Solutions, Administration Sets, and Inhalation Therapy Supplies

Date _____

Catalog No.	Quantity	Unit	Solutions	Inventory
110. 57		CS	D–5–2 Nacl, 500 cc	
109. 54		CS	D–5–½ S, 500 cc	
110. 07		CS	D–5–½ S, 1,000 cc	
111. 54		CS	D–5–H.S., 1,000 cc	
113. 58		CS	H.S., 250 cc	
114. 05		CS	H.S., 500 cc	
114. 55		CS	H.S., 1,000 cc	
115. 02		CS	1–5–W, 1,000 cc	
116. 00		CS	1–10–W, 1,000 cc	
115. 52		CS	1–10–S, 1,000 cc	
110. 50		CS	1–10–E–2, 1,000 cc	
118. 03		CS	1–10–W, 1,000 cc	
117. 50		CS	1–10–S, 1,000 cc	
118. 53		CS	M/0 SL, 500 cc	
119. 00		CS	M/0 SL, 1,000 cc	
119. 50		CS	NSS, 30 cc	
120. 03		CS	NSS, 250 cc	
120. 53		CS	NSS, 500 cc	
121. 00		CS	NSS, 1,000 cc	
101. 58		CS	D–5–BES, 1,000 cc	
101. 08		CS	B–E–S, 1,000 cc	
121. 50		CS	P.I.S., 500 cc	
122. 07		CS	P.2.S., 500 cc	
122. 57		CS	R.S., 1,000 cc	
100. 01		CS	A–5–D5W, 1,000 cc	
123. 04		CS	Amigen 5 percent, dextrose 5 percent	
123. 54		CS	Amigen 5 percent levigon 10 percent	
117. 06		CS	K.N.L., 500 cc	
100. 03		CS	Dextran, 6 percent, 500 cc	
102. 05		CS	D–W, 30 cc distilled water	
102. 55		CS	D–W, 1,000 cc distilled water	
103. 02		CS	D–2½ W, 250 cc	
104. 00		CS	D–5–W, 500 cc	
104. 50		CS	D–5–W, 1,000 cc	
108. 07		CS	D–5–S, 250 cc	
108. 31		CS	D–5–S, 500 cc	
109. 04		CS	D–5–S, 1,000 cc	
105. 00		CS	D–10–W, 500 cc	
105. 50		CS	D–10–W, 1,000 cc	

Catalog No.	Quantity	Unit	Solutions—Continued	Inventory
112 51		CS	D–10–S, 500 cc	
113. 08		CS	D–10–S, 1,000 cc	
106. 53		CS	D–2½ S, 250 cc	
107. 00		CS	D–2½ S, 500 cc	
107. 50		CS	D–2½–½ S, 250 cc	
112. 01		CS	D–5 R.S., 1,000 cc	
103. 52		CS	D–5–W, 250 cc	
111. 04		CS	D–5–03 percent NaCl	
			Administration Sets	
126. 55		Ctn.	Intravenous	
127. 52		Ctn.	Subcutaneous	
128. 02		Ctn.	Transfusion—Single	
128. 03		Ctn.	Transfusion—Double	
128. 04		Ctn.	Transfusion—Pump	
124. 51		Ctn.	Extension sets	
132. 87		Ea.	Intravenous Catheter #19 gauge	
125. 10		Ctn.	Scalp vein sets, 20G needle	
125. 58		Ctn.	Scalp vein sets, 22G needle	
126. 05		Ctn.	Scalp vein sets, 23G needle	
			Inhalation Therapy Supplies	
704. 49		Box	Catheter oxygen 10 FR	
704. 81		Box	Catheter oxygen 14 FR	
703. 26		Box	Cannulus oxygen	
704 07		Ea.	Canopies croup	
705. 20		Box	Tubing, connecting	
200. 81		Ea.	Nebulizers #40	
706. 43		Ea.	Masks oxygen	
703. 68		Ea.	Tents oxygen #25	
703. 84		Ea.	Tents oxygen #90	

Signed _____

Figure 11.—General Stores Requisition for CMSSS: Dressings

Date _____

Catalog No.	Quantity	Unit	Dressings	Inventory
131. 04		Ctn.	Abdominal pads—5 x 0 S.	
131. 54		Ctn.	Abdominal pads—8 x 10 NS.	
100. 09		Tube	Adhesive tape, ½-inch	
100. 59		Tube	Adhesive tape, 1-inch	
101. 06		Tube	Adhesive tape, 2-inch	
101. 56		Tube	Adhesive tape, 3-inch	
102. 03		Tube	Adhesive tape—waterproof 2-inch.	
102. 53		Box	Adhesive straps, 8½ x 11½-inch.	
103. 00		100 pk	Applicators, cotton tip S-6-inch.	
103. 50		100 pk	Applicators, cotton tip N-S-0-inch.	
104. 57		Ctn.	Balls—cotton—medium.	
105. 04		Ctn.	Balls—cotton—large	
108. 05		Box	Band aids, ¾-inch	
111. 02		Doz.	Bandages—elastic, 2-inch.	
111. 52		Doz.	Bandages—elastic, 3-inch.	
112. 00		Doz.	Bandages—elastic, 4-inch.	
112. 50		Doz.	Bandages—elastic, 6-inch.	
113. 06		Ea.	Bandages—adhesive knit, 2-inch.	
113. 56		Ea.	Bandages—adhesive knit, 3-inch.	
114. 03		Ea.	Bandages—adhesive knit, 4-inch.	
115. 00		Box	Bandages—roller, 1-inch.	
115. 50		Box	Bandages—roller, 2-inch.	
116. 07		Box	Bandages—roller, 3-inch.	
114. 53		Doz.	Bandages—Gauze, 2-inch.	
117. 04		Box	Blades, tongue, wrapped—adult.	
116. 57		Box	Blades, tongue, wrapped—junior.	
117. 54		Box	Cleaners—small	
118. 01		Bag	Cleaners—large	
118. 51		Roll	Cotton—absorbent, 1 lb. roll.	
120. 51		Ctn.	Gauze fluffs	
125. 06		Ctn.	Gauze sponges, 3 x 3	
126. 03		Ctn.	Gauze—sponges, 4 x 3 S.	
126. 53		Ctn.	Gauze—sponges, 4 x 3 NS.	
123. 02		Ea.	Gauze—packing, ½-inch plain.	
123. 44		Ea.	Gauze—packing, 1-inch plain.	
123. 86		Ea.	Gauze—packing, 2-inch plain.	
121. 08		Ea.	Gauze—packing, ½-inch IODO 5 percent.	
121. 58		Ea.	Gauze—packing, 1-inch IODO 5 percent.	
122. 05		Ea.	Gauze—packing, 2-inch IODO 5 percent.	
120. 54		Ctn.	Packs—colostomy	
132. 01		Box	Pads—eye	
133. 08		Ctn.	Pads—O.B	
135. 02		Box	Sponges—alcohol	
135. 52		Box	Tape—non-allergic, 1-inch.	
136. 00		Box	Tape—non-allergic, 2-inch.	
127. 00		Box	Petroleum jelly gauze, ½ x 72.	
127. 50		Box	Petroleum jelly gauze, 1 x 36.	
128. 07		Box	Petroleum jelly gauze, 3 x 18.	
120. 04		Box	Petroleum jelly gauze, 6 x 36.	
132. 51		Ctn.	Pads—breast	
416. 66		Case	Towelettes	
139. 50		Ctn.	Underpads—blue, 17½ x 24.	

Signed _____

Figure 12.—General Stores Requisition for CMSSS: Needles and Syringes

Date_____

Catalog No.	Quantity	Unit	Needles and syringes	Inventory
800. 00		Box	Needles disp., 19G x 1½-in.	
800. 68		Box	Needles disp., 21G x 1-in.	
800. 02		Box	Needles disp., 21G x 1½-in.	
801. 23		Box	Needles disp., 22G x 1½-in.	
801. 57		Box	Needles disp., 23G x 1-in.	
801. 81		Box	Needles disp., 25G x ⅝-in.	
802. 46		Box	Syringe disp., 2½ cc	
802. 88		Box	Syringe disp., 6 cc	
803. 27		Box	Syringe disp., 12 cc	
803. 60		Ea.	Syringe disp., 20 cc	
804. 08		Ea.	Syringe, aspirating disp., 50 cc.	
804. 82		Box	Syringe disp., 2½ cc 19G x 1½.	
805. 63		Box	Syringe disp., 2½ cc 21G x 1½.	
806. 02		Box	Syringe disp., 2½ cc 22G x 1½.	
806. 36		Box	Syringe disp., 2½ cc 23G x 1.	
806. 60		Box	Syringe disp., 2½ cc 25G x ⅝.	
807. 25		Box	Syringe, 1cc 40–80 U Insulin w/25 x ⅝.	
807. 83		Ea.	Syringe, 1cc tuberculin w/27 x ½.	
808. 72		Ea.	Asepto syringe, 2 cc	
809. 03		Ea.	Asepto barrels, 2 cc	
809. 37		Ea.	Asepto bulbs, 2 cc	
810. 22		Ea.	Irrigating syringe, 50 cc.	
810. 50		Ea.	Syringe mult., 2 cc	
810. 83		Ea.	Barrels, 2 cc	
820. 10		Ea.	Plungers, 2 cc	
820. 44		Ea.	Syringe mult., 5 cc	
820. 78		Ea.	Syringe barrels, 5 cc	
821. 00		Ea.	Syringe plungers, 5 cc	
821. 33		Ea.	Syringe mult., 10 cc	
821. 67		Ea.	Syringe barrels, 10 cc	
821. 91		Ea.	Syringe plungers, 10 cc	
822. 56		Ea.	Syringe mult., 20 cc	
822. 56		Ea.	Syringe barrels, 20 cc	
822. 80		Ea.	Syringe plungers, 20 cc	
			Needles	
810. 56		Ea.	Aspirating hypo, 13 x 2.	
810. 08		Ea.	Aspirating hypo, 13 x 3.	
811. 11		Ea.	Aspirating hypo, 15 x 1½.	
811. 79		Ea.	Aspirating hypo, 15 x 3½.	
812. 00		Ea.	Aspirating hypo, 16 x 3½.	
812 68		Ea.	Aspirating hypo, 18 x 2.	
812. 92		Ea.	Aspirating hypo, 19 x 3.	
813. 23		Ea.	Aspirating hypo, 20 x 1½.	
813. 57		Ea.	Aspirating hypo, 21 x 2.	
813. 81		Ea.	Aspirating hypo, 22 x 2.	
814. 12		Ea.	Aspirating hypo, 22 x 3.	
815. 03		Ea.	Biopsy-long	
600. 54		Doz.	Cutting needles, #1822–14.	
601. 01		Doz.	Cutting needles, #1822–16.	
601. 51		Doz.	Cutting needles, #1822–18.	
816. 24		Ea.	Spinal 16 x 3	
816. 82		Ea.	Spinal, 18 x 3	
817. 13		Ea.	Spinal, 18 x 6	
817. 47		Ea.	Spinal, 19 x 3	
817. 71		Ea.	Spinal, 20 x 2	
818. 02		Ea.	Spinal, 20 x 3½	
818. 03		Ea.	Spinal, 22 x 2	
818. 60		Ea.	Spinal, 22 x 3½	
818. 94		Ea.	Titus, 18 x 1¼	

Signed _____

Figure 13.—General Stores Requisition for CMSSS: Miscellaneous

Date _____

Catalog No.	Quantity	Unit	Miscellaneous	Inventory	Catalog No.	Quantity	Unit	Miscellaneous	Inventory
700. 83		Ea.	Airways—peds		332. 89		Pr.	Slippers—stretch—child.	
701. 64		Ea.	Airways—adult		332 97		Pr.	Slippers—stretch—adult.	
400. 00		Ea.	Arm boards, 9 inches		310. 29		Ctn.	Paper wrap, 13 x 13	
400 42		Ea.	Arm boards, 18 inches		310. 53		Ctn.	Paper wrap, 20 x 20	
400. 84		Ea.	Arm board sleeves, 18 inches.		311. 18		Ctn.	Paper wrap, 40 x 40	
312. 31		Roll	Autoclave tape, ¾ inch.		311. 76		Ea.	Stopcocks—plastic, 3-way W/TB.	
301. 04		Pkg.	Bags—paper, #1 white		311. 76		Ea.	Stopcocks—plastic, 3-way N/TB.	
301. 12		Pkg.	Bags—paper, #4 white		415. 85		Cone	String cones, 3-ply	
301. 20		Pkg.	Bags—paper, #12, wh		416. 08		Cone	String cones, 6-ply	
300. 07		Pkg.	Bags—paper, #16, bl		403. 69		Box	Soap, enema	
303. 08		Pkg.	Bags—catheter, ster		606. 58		Doz.	Shields, breast	
303. 40		Pkg.	Bags—syringe, ster		316. 21		Ctn.	Tubes—flush	
303. 24		Box	Bags—needle, ster		321. 30		Ctn.	Catheterization trays	
303. 60		Box	Bags—therm., oral		321. 64		Ctn.	Enema adm. sets	
303. 90		Box	Bags—therm., rectal		321. 98		Ctn.	Irrigation trays	
412. 42		Doz.	Belts—sanitary		322. 29		Ctn.	Prep. shave kits	
203. 03		Gro.	Blades, #10 N.S		213. 15		Ea.	Liners—plastic, med	
203. 53		Gro.	Blades, #11 N.S		213. 23		Ea.	Liners—plastic, lg	
204. 00		Gro.	Blades, #15 N.S		218. 44		Gal.	Soap	
204. 50		Gro.	Blades, #20 N.S		311. 58		Doz.	Thermometer—oral	
403. 27		Lb.	Cleaner—instrument		312. 05		Doz.	Thermometer—rectal	
411. 61		Ea.	Cleaner—pipe, 3 mm		210. 42		Box	Micro slides	
412. 00		Ea.	Cleaner—pipe, 5 mm		317. 10		Ctn.	Stomach tubes, size 12	
308. 44		Ea.	Cups—denture		317. 36		Ctn.	Stomach tubes, size 16	
308. 45		Ea.	Cups—sputum		317. 52		Ctn.	Stomach tubes, size 18	
308. 79		Ea.	Cups—urine measuring.		318. 09		Ctn.	Rectal tubes, size 24	
406. 44		Lb.	Glove powder		319. 80		Case	Specimen bottles, disp	
207. 53		Ea.	Jars—glass, 3 x 3		320. 17		Roll	Specimen caps	
208. 00		Ea.	Jars—glass, 4 x 4		312. 05		Roll	Glove marking tape, 6	
208. 50		Ea.	Jars—glass, 5 x 5		322. 05		Roll	Glove marking tape, 6½.	
209. 07		Ea.	Jars—glass, 6¾ x 3 in		312. 99		Roll	Glove marking tape, 7	
207. 03		Ea.	Jars—infusion		313. 20		Roll	Glove marking tape, 7½.	
315. 08		Ea.	Culture tube applic		313. 54		Roll	Glove marking tape, 8	
400. 86		Doz.	Lotion—hand		314. 10		Roll	Glove marking tape, 8½.	
407. 67		Gro.	Lubricant foil packs						
407. 25		Doz.	Lubricant tubes, 5 oz						
410. 48		Gro.	Pins—safety, #1						
411. 29		Gro.	Pins—safety, #3						
416. 58		Ea.	Razors—disposable						
300. 92		Pr.	Slippers—paper						

Signed _____

Figure 14.—General Stores Requisition for CMSSS: Orthopedic Supplies

Date _____

Catalog No	Quantity	Unit	Orthopedic supplies	Inventory	Catalog No.	Quantity	Unit	Orthopedic supplies	Inventory
500. 05		Pr.	Crutches, adj.—child		519. 52		Pr.	Limb holder—adult	
500. 55		Pr.	Crutches, adj.—junior					Rope—clothes line	
507. 02		Pr.	Crutches, adj.—adult						
508. 09		Pr.	Crutch tips, ⅞ #2915						
507. 52		Pr.	Crutch pads, #108						
505. 58		Ea.	Canes—with tips						
509. 03		Doz.	Slings						
515. 54		Ea.	Heels, rubber—child						
516. 01		Ea.	Heels, rubber—adult						
514. 07		Ea.	Head halters						
533. 02		Tube	Mole skin—tape						
523. 56		Ea.	Padding—felt, ¼-inch						
524. 03		Ea.	Sponge rubber, ¼-inch						
502. 07		Ea.	Belts—pelvic trac., 26–30.						
502. 57		Ea.	Belts—pelvic trac., 30–34.						
503. 04		Ea.	Belts—pelvic trac., 34–38.						
503. 54		Ea.	Belts—pelvic trac., 38–42.						
504. 01		Ea.	Belts—pelvic trac., 42–46.						
504. 51		Ea.	Belts—pelvic trac., 46–50.						
500. 53		Ctn.	Wadding sheet, 2-inch						
501. 00		Ctn.	Wadding sheet, 4-inch						
501. 50		Ctn.	Wadding sheet, 6-inch						
518. 50		Ea.	Body holder—pediatrics.						
518. 55		Ea.	Body holder—adult						
519. 02		Pr.	Limb holder—pediatrics.						

Signed _____

Figure 15.—General Stores Requisition for CMSSS: Rubber Goods

Date _____

Catalog No.	Quantity	Unit	Rubber goods	Inventory	Catalog No.	Quantity	Unit	Rubber goods	Inventory
421. 31		Ea.	Levine tubes—10 FR.		411. 01		Ea.	Catheter tracheal—rubber, 8 FR.	
421. 73		Ea.	Levine tubes—12 FR.						
422. 12		Ea.	Levine tubes—14 FR.		411. 27		Ea.	Catheter tracheal—rubber, 10 FR.	
422. 54		Ea.	Levine tubes—16 FR.						
422. 96		Ea.	Levine tubes—18 FR.		411. 09		Ea.	Catheter tracheal—rubber, 12 FR.	
401. 21		Ea.	Catheter—foley, 8 FR.–3 cc.		411. 03		Ea.	Catheter tracheal—rubber, 14 FR.	
401. 03		Ea.	Catheter—foley, 10 FR.–3 cc.		420. 02		Ea.	Cantor tubes—clay adams, 10 FR.	
402. 02		Ea.	Catheter—foley, 12 FR.–5 cc.		423. 35		Ea.	Miller-Abbot tubes—14 FR.	
402. 44		Ea.	Catheter—foley, 14 FR.–5 cc.		423. 77		Ea.	Miller-Abbot tubes—16 FR.	
402. 86		Ea.	Catheter—foley, 16 FR.–5 cc.		424. 16		Ea.	Miller-Abbot tubes—18 FR.	
403. 25		Ea.	Catheter—foley, 18 FR.–5 cc.		424. 90		Ea.	Rectal tubes—24 FR.	
403. 67		Ea.	Catheter—foley, 20 FR.–5 cc.		429. 03		Ft.	Tubing amber, ⅛ × 1/32	
404. 06		Ea.	Catheter—foley, 22 FR.–5 cc.		429. 61		Ft.	Tubing amber, 3/16 x 1/16.	
404. 48		Ea.	Catheter—foley, 24 FR.–5 cc.		420. 37		Ft.	Tubing amber, Barron Pump tubing, ⅛ x 1/16.	
404. 80		Ea.	Catheter—foley, 26 FR.–5 cc.					Tubing penrose, ¼ x 36.	
405. 29		Ea.	Catheter—foley, 28 FR.–5 cc.					Tubing penrose, ⅜ x 36.	
								Tubing penrose, ½ x 36.	
405. 61		Ea.	Catheter—foley, 20 FR.–30 cc.					Tubing penrose, 1 x 30.	
406. 00		Ea.	Catheter—foley, 22 FR.–30 cc.		412. 40		Ea.	Cushions—invalid, rubber, 12-inch.	
406. 42		Ea.	Catheter—foley, 24 FR.–30 cc.		412. 82		Ea.	Cushions—invalid, rubber, 14-inch.	
407. 23		Ea.	Catheter—foley, 24 FR.–75 cc.		413. 21		Ea.	Cushions—invalid, rubber, 16-inch.	
408. 04		Ea.	Catheter—all-purpose, 8–12 FR.		413. 63		Ea.	Cushions—sponge rubber, 16-inch.	
408. 46		Ea.	Catheter—all-purpose, 14–16 FR.		414. 86		Gro.	Cots—finger, medium	
					416. 98		Doz.	Gloves—disp., 6½	
408. 62		Ea.	Catheter—all-purpose, 18–20 FR.		417. 37		Doz.	Gloves—disp., 7	
					417. 70		Doz.	Gloves—disp., 7½	
409. 35		Ea.	Catheter—pezzar, 20 FR.		418. 18		Doz.	Gloves—disp., 8	
					418. 60		Doz.	Gloves—disp., 8½	
409. 69		Ea.	Catheter—pezzar, 24 FR.		419. 73		Box	Gloves—examination	
					415. 25		Doz.	Gloves, nonallergic, 6½.	
410. 04		Ea.	Catheter—pezzar, 28 FR.		415. 67		Doz.	Gloves—nonallergic, 7½.	
410. 46		Ea.	Catheter—pezzar, 32 FR.		416. 06		Doz.	Gloves—nonallergic, 8.	

Signed _____

Although other considerations such as physical facilities, efficiency of operation, and inventory are of great importance, they are secondary to the responsibility of preserving sterility of supplies. The department would be defeating its purpose if, after laborious and conscientious processing, the end products were not safe to use. It is important to note that the shelf-life of items not enclosed in polyethylene bags, heat-sealed, and intact is only one month. Outdated items should be reprocessed to attain sterility and not merely resterilized.

ENVIRONMENT

The quality of the storage of sterilized items is of necessity closely related to the environment in which this storage takes place. Ideally, sterile storage should serve no other function than that of storing sterile supplies. The necessary physical facilities for the ideal situation may not always be available, but frequently the present situation can be improved.

Access to the sterile storage area should be limited and controlled. Only personnel assigned to the area and those who are familiar with its function and requirements should be permitted into this section.

Sweeping, dry mopping, or dusting should be prohibited. All necessary cleaning should be done with a damp mop or cloth, or preferably by wet vacuum.

HANDLING

The best environment cannot compensate for the improper handling of sterile supplies. Every item in sterile storage should display some visible evidence of having been sterilized. Pressure-sensitive sterilizer tape, preprinted labels, and other visible indications are available. They do not guarantee sterility but they do eliminate the possibility of nonsterile items being placed in sterile storage by human error. Undue handling of small items can be avoided if these items are sterilized in a basket or rack that can be transferred to the storage shelf. Items must be thoroughly dry and cool before storing on shelves.

Equipment Storage

This area houses portable equipment used in rendering patient care. It may include orthopedic

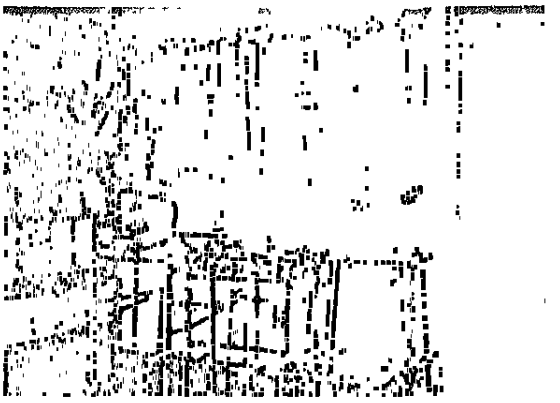

Figure 16. Orthopedic Equipment and Storage.

as well as oxygen therapy equipment. See figures 16 and 17 for suggested methods of storage of orthopedic equipment. Any equipment stored in this area must be processed as recommended in chapter V.

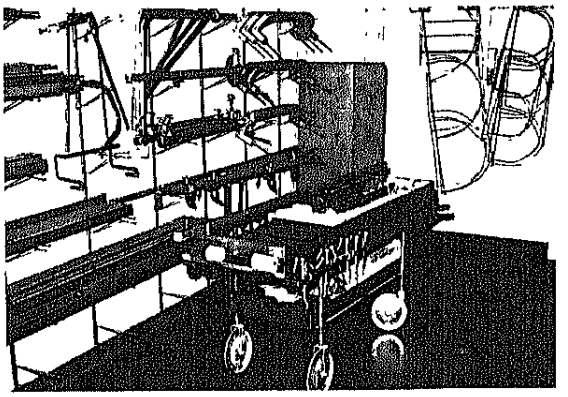

Figure 17. Overhead Frames and Orthopedic Cart in Storage.

Inventory

No general rule can be established for the size, type, or even control of the inventory of supplies. In each hospital there are various factors that influence it. The size and type of the hospital, the availability of supplies, and the amount and size of stock in the nursing units all affect supplies to an extent that makes it impossible to establish anything other than guidelines.

Basic to all inventories is the need for the item to be available when requested. This availability

should be considered carefully. The prime purpose of the department is service which will contribute to the improvement of patient care. If supplies are not available, the department is not functioning efficiently. Therefore, the size of the inventory of supplies should be established at a level which will make any reasonable item available when requested. To achieve this, it is advisable to set the inventory level at two or three days' normal use. The extra days' supply assures regular delivery in emergency situations.

Inventory of supplies has several advantages.

- It serves as a guide in the location of supplies.
- It eliminates guesswork in the ordering of supplies, as an estimate of future needs may be obtained from the amounts used in a given period.
- It is an aid in planning the budget for the department.
- It assists in the control of supplies.

File cards may be used for inventory. (See figure 18 for an example.) The card should contain the following information:

- Item
- Description, such as size, material
- Unit of order, such as each, dozen or gross; if case, amount in case
- Catalog No.
- Location, such as bulk storage, section and shelf

Figure 18.—Inventory Card

Item	*Description*	*Unit*	*Cat. No.*	*Location*	*(Inventory control)*	
Sponges	4 x 4 gauze 16 ply	4M/cs.	132.64	Bulk storage	Maximum 25 cs.	Minimum 10 cs.

Amount on hand	*Date ordered*	*Amount ordered*	*Date received*	*Amount received*	*Balance on hand*		
16 cs.	5-2-65	15 cs.	5-6-65	15 cs.	25 cs.		
14 cs.	5-9-65	11 cs.	5-11-65	8 cs.	22 cs.		

Sponges: 4 x 4 Gauze - 16 ply

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Chapter XI

DISPENSING OF SUPPLIES AND EQUIPMENT

General Considerations

There are two main purposes for establishing a procedure for the dispensing of supplies and equipment. The primary purpose is improvement of patient care by providing prompt service. The mainstay of this service is the efficiency with which supplies and equipment are dispensed to those areas directly concerned with patient care. The secondary purpose is to provide data regarding the economic status of the department by maintaining accurate records of items dispensed.

The main purpose—service—may be accomplished by direct or indirect delivery of supplies and equipment. There are several methods of delivery.

Dispensing Methods

CART

A cart is supplied with all items that would normally be used in a 24-hour period. The cart is delivered daily to each service or nursing unit. The extra supplies allow for emergency situations.

Advantages:

- The cart may be prepared in advance.
- The exchange is quickly made. As the cart with fresh supplies is taken up, the cart from the previous day is returned.

Limitations:

- Consumption of supplies varies from day to day.
- Supplies not used are handled unnecessarily.

STOCK

A stock supply of the items required in a given period is established. This supply is replenished daily or several times a day depending upon the stock area, the amount of supplies used, and other circumstances.

Advantages:

- Serviced area is always well supplied.
- Time-saving for nursing personnel results.

Limitations:

- The checking of supplies on the unit is time-consuming.
- The size of the cart is quite cumbersome as it contains all types of supplies and equipment that may need to be replaced.

REQUISITION

In this method all nursing units and specialty areas send a list of their requirements to the department. These supplies are delivered to the respective areas.

Advantages:

- Provides good control of supplies.
- Preprinted forms listing the items used are time-saving. (See figure 19 for nursing unit requisition form, and figure 20 for an example of a form for specialty departments.) These supplies are charged to the using unit. This method will be successful if personnel on units check requisition with items used. Figure 21 is an example of patient-charge requisition form.

Limitations include:

- Hoarding of supplies.
- Waste of unused resources.

A record must be kept of the supplies issued regardless of the method used.

Figure 19.—Nursing Unit Requisition for Non-charge Stock Items

Date_____

	Unit	Order	Issue	Cost
Dressings:				
A.B.D.'s	Box/24			
Adhesive tape, ½-inch.	Roll			
Adhesive tape, 1-inch	Roll			
Adhesive tape, 2-inch	Roll			
Applicators, 6-inch	Pk/2			
Bandage, 1-inch	Roll			
Bandage, 2-inch	Roll			
Small cotton ball—small jar.	Jar			
Small cotton ball—large jar.	Jar			
Large cotton ball—small jar.	Jar			
Large cotton ball—large jar.	Jar			
Eye pads	Ea.			
Sanitary pads	Pk/12			
Sponges—2 per pk	Box/24			
Tongue blades	Doz.			
Gloves:				
0½	Pr.			
7	Pr.			
7½	Pr.			
8	Pr.			
8½	Pr.			
Miscellaneous:				
Alcohol sponges	Box/100			
Arm board sleeves	Ea.			
Baby packs	Ea.			
Bed-pan covers	Doz.			
Culture tubes	Ea.			
Finger cots	Jar			
Hot water bottles	Ea.			
Ice caps	Ea.			
Lubricant pack	Doz.			
Medicine droppers	Ea.			
Paper slippers	Pr.			
Paper bags	Doz.			
Soap—enema	Doz.			
Specimen bottle	Ea.			
Sputum cups	Ea.			
Urinal covers	Ea.			
Shields—breast	Ea.			
Instruments:				
Clip removers	Ea.			
Forceps—tissue—thumb.	Ea.			
Hemostats—curved	Ea.			
Hemostats—straight	Ea.			
Knife handles	Ea.			

	Unit	Order	Issue	Cost
Instruments—Con.				
Probe	Ea.			
Suture set	Ea.			
Transfer forceps	Ea.			
Needles, disposable:				
19G. x 1½-inch	Doz.			
21G. x 1½-inch	Doz.			
22G. x 1½-inch	Doz.			
23G. x 1-inch	Doz.			
25G. x ⅝-inch	Doz.			
Syringes, disposable:				
2½ cc	Doz.			
6 cc	Doz.			
10 cc	Doz.			
20 cc	Doz.			
30 cc	Doz.			
50 cc	Doz.			
Asepto	Ea.			
Insulin	Ea.			
Tuberculin	Ea.			
Needles and syringes, disposable:				
2 cc x 19G. x 1½-inch	Doz.			
2 cc x 21G. x 1½-inch	Doz.			
2 cc x 22G. x 1½-inch	Doz.			
2 cc x 23G. x 1-inch	Doz.			
2 cc x 25G. x ⅝-inch	Doz.			
Solutions, external:				
N.S.S. 30 cc	Ea.			
D.W. 30 cc	Ea.			
Normal saline—1,000 cc.	Ea.			
Boric solution 2 percent—1,000 cc.	Ea.			
Sterile water—1,000 cc.	Ea.			
Utensils:				
Basins—round, small	Ea.			
Basins—round, large	Ea.			
Basins—curved	Ea.			
Graduates—1,000 cc	Ea.			
Graduates—500 cc	Ea.			
Water pitcher set	Ea.			
Linen, sterile:				
Gowns—doctor	Ea.			
Gowns—patient	Ea.			
Masks	Ea.			
O.R. caps	Doz.			
Pillowcases	Ea.			
Sheets—draw	Ea.			
Sheets—large	Ea.			
Towels—large	Ea.			
Towels—small	Ea.			

Station_____

Signed_____

Figure 20.—Delivery Room Requisition for Non-charge Stock Items

Date_____

	Unit	Order	Issue	Cost
Dressings:				
A.B.D.'s	Box/24			
Adhesive tape, ½ inch	Roll			
Adhesive tape, 1 inch	Roll			
Adhesive tape, 2 inch	Roll			
Applicators, 6 inch	Pk/2			
Small cotton ball—small jar.	Jar			
Small cotton ball—large jar.	Jar			
Large cotton ball—small jar.	Jar			
Sanitary pads	Pk/12			
Sponges, 2 per pk	Box/12			
Gloves:				
6½	Pr.			
7	Pr.			
7½	Pr.			
8	Pr.			
Exam. gloves, 8½	Pr.			
Miscellaneous:				
Alcohol sponges	Box/100			
Cord clamps	Ea.			
Cord ties	Ea.			
Mucus traps	Ea.			
Paper slippers	Pr.			
Specimen bottle	Ea.			
Solutions:				
N.S.S. 30 cc	Ea.			
D.W. 30 cc	Ea.			

	Unit	Order	Issue	Cost
Needles, disposable:				
#19G x 1½-inch	Doz.			
#21G. x 1½-inch	Doz.			
#22G. x 1½-inch	Doz.			
#23G. x 1-inch	Doz.			
#25G. x ⅝-inch	Doz			
Syringes, disposable:				
2 cc	Doz.			
6 cc	Doz			
12 cc	Doz.			
20 cc	Doz.			
Asepto	Ea			
Insulin	Ea.			
Tuberculin	Ea.			
Bulb syringes	Ea.			
Needles and syringes, disposable:				
2cc with 21G. x 1½-inch.	Doz.			
Linen, sterile:				
Blankets—baby	Ea.			
Covers—spec. foot	Ea.			
Gowns—Dr	Ea.			
Leggings—O.B.	Ea.			
Packs—Caesarean	Ea.			
Packs—vaginal	Ea.			
Sheets—double	Ea.			
Sheets—drape	Ea.			
Sheets—O	Ea			
Towels—large	Ea			

Station_____

Signed_____

Figure 21.—Patient-Charge Requisition

Patient—Charge requisition Supplies—and Equipment	Date Room Name Pt. No. Doctor_____	
Description	Quantity	Amount
	Total	

Requisitioned by_____

Business Office Copy
CMSSS Duplicate Copy

Economic Aspects

It is well to review the other objectives of the department, particularly the two mainly concerned with the dispensing area:

- To reduce total cost of the department by cost analysis of personnel, supplies, and equipment.
- To maintain an accurate inventory of supplies and equipment.

Hospital administrators are becoming more aware that the greatest expenditure of income is for personnel. To relieve this financial burden, more methods of labor-saving devices are installed in hospital areas. In the area of distribution pneumatic tubes may be used for small items, dumbwaiters for standard items, and the elevator for portable equipment. A system of vertical conveyors that automatically discharge the requested items at a special place is the latest contribution to hospitals in automatic dispensing.

Cost analysis should be made of the time and effort expended in effectively dispensing supplies manually as compared with the cost of automatic distribution. In many instances the automatic method would prove to be more economical over a given period of time.

Personnel should be acquainted with the cost of equipment and supplies. Vast amounts of supplies are delivered from general stores regularly. Personnel should be informed as to the reality of the situation. Supplies received from general stores are charged to the CMSSS. The cost of these supplies must be reallocated to the area or patient using the supplies.

Reference is frequently made to chargeable or nonchargeable items. All items involve expense; whether the department utilizing the supplies or the individual patient assumes responsibility for that expense depends upon the policies of each hospital. Monetary loss in the CMSSS is frequently the result of poor controls, inefficiency in operation, and overstocked inventory.

CONTROL

The first factor to consider in establishing centralized control is a good orientation program for new employees. This should be followed by a continuing departmental inservice program for all hospital personnel in the proper use of supplies and equipment. This can be accomplished by having written policies governing dispensing. Control may be facilitated by a record of all items dispensed, and by developing a definite system for the requisitioning and dispensing of supplies and equipment.

Suggestions for improving control systems include:

- Hold individual nursing unit or specialty department accountable for lost equipment.
- Have a perpetual "follow-up system."
- Through cooperative effort inform users of supplies and equipment of the importance of control.
- Do periodic equipment control study to determine frequency of use of "special" equipment.
- Mark all equipment legibly and where it can be seen.
- Number all trays and portable equipment.
- Reduce the amount of outdated supplies by proper rotation.

• Use peg-board method for location of each piece of equipment and special tray dispensed from the department.

EFFICIENCY

In the area of dispensing, efficiency is necessary not because of the monetary loss alone, but because the efficient handling of supplies will result in a higher quality of service to the patient. Misuse, inefficient processing, and poor methods of dispensing supplies can be as detrimental to the quality of patient care as the lack of personnel on the nursing unit.

INVENTORY

Establishing maximum and minimum levels of inventory has many advantages; among them are: 1) bookkeeping is simplified, (2) overstocking and depletion of stock are negated, (3) more economical means of purchasing is possible, and (4) the availability of supplies when requested is enhanced. Control of inventory and accurate records within the department aid in the maintenance of the perpetual inventory.

INDEX TO SUPPLIES AND EQUIPMENT

A simple method of locating supplies is that of allocating a letter to each section in which supplies are stored. The section may be a closed cupboard or open shelving; the section may be marked with a letter, and each shelf with a number. This eliminates labeling shelves and hunting for supplies. For example, cardiac needles would be located in section C, shelf 5. See figure 22, which is an illustration of a visible file index of supplies and equipment. At the conclusion of this chapter is a sample of an index to supplies and equipment. This index includes a *partial listing* of supplies and equipment which are located according to method of distribution. For example, supplies pertaining to eye care are placed in the same section, A, but each item is indexed in the file: eye pad under Dressings, medicine dropper under Glassware, and eye shield under Miscellaneous. The purpose of this is to enable personnel to locate supplies more readily. In addition, many supplies are also cross-indexed, such as eye dropper with medicine dropper. This detailed cross-indexing is necessary because of the wide variety in the use of terms.

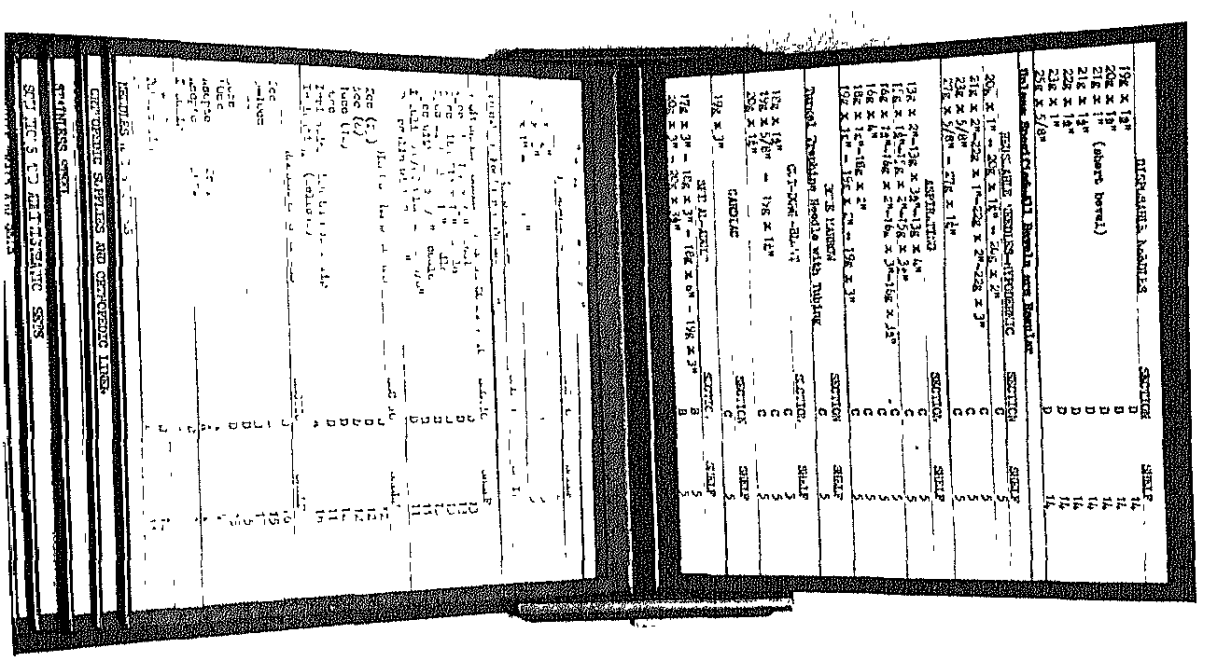

Figure 22. Visible File Index.

208-750 O - 68 - 8

Items	Section	Shelf
Catheters, Tubes, and Tubing		
Catheters		
All-Purpose, French, Disposable—Sizes:		
Small 8–12	E	27
Medium 14–16		
Large 18–20		
Aspirating	E	27
Foley—Sizes 8 to 24	E	30
French—Sizes 8 to 22	E	29
Nasal—Size 14	E	28
Nasal—Size 10	E	29
Tracheal—Size 14	E	29
Tubes		
Cantor (Regular and Disposable)	F	14
Esophageal Sengstaken	F	14
Extension	E	25
Feeding, Adult-Child-Infant	E	31
Gastric (All Types)	F	13–14
Harris Flush	A	7
Henor-Smathers	F	6
Intracath—Sizes 14, 17, 19	E	32
Jackson Tracheal	B	4
Levine (Rubber) Sizes: 10, 12, 14, 16, 18.	F	6–14
Levine (Disposable) Sizes: 12, 16, 18	F	13
Miller-Abbot	F	14
Nasal Suction	A	13
Rectal (Disposable)	A	7
Rectal (Rubber)	E	20
Stomach	F	13
Suction	F	13
Tubing		
Enema Tubing	A	7
Intravenous Set	E	15
Penrose Drain	D	16
Polyethylene	C	6
Tourniquet	E	31
Tracheotomy	B	4
Tubing With Trocar	B	6
Tubing Y With Bulb	F	6
Scalp Vein	E	24
Urinary Drainage	A	22
Dressings		
A.B.D. or Combination Pad	D	19
Adhesive Strips	C	4
Adhesive Tape (All Sizes)	C	4
Applicators, 6 Inch—Sterile	C	8
Applicators, 3 Inch—Sterile	C	8
***Dressings*—Continued**		
Applicator Sticks	C	0
Band Aids	D	6
Bandages, Cotton Elastic	F	12
Bandages, Rubber Elastic	F	11
Cotton Balls (Large and Small)—Sterile.	C	2
Colostomy Drainage Packs	D	0
Depressors (Tongue)—Sterile	C	4
Drainage Pack—Sterile	D	9
Eye Pads	A	21
Fluffs—Sterile	D	2
Gauze Packing (Iodoform)	F	4
Gauze Packing (Plain)	F	5
Gauze (Vaseline)	F	6
Mole Skin	(1)	
Montgomery Straps	C	0
Sponges (3 x 3)—Sterile	D	20
Sponges (4 x 4)—Sterile	D	21–22
Tracheotomy	B	4
Underpads	E	30–40
Vaginal Packs	D	11
Glassware		
Atomizer—Nasal	G	5
Bladder—Irrigator	A	18
Bottles—Large, Urinary, Drainage, Sterile.	F	10
Bottles—Large, Urinary, Drainage, Nonsterile.	G	16
Bottles—Specimen	F	3
Breast Shields	I	15
Connecting Tubes—Sterile Glass	D	16
Culture Tubes	D	16
Eye Glass Cup	A	21
Eye Dropper	A	21
Glass Connectors	D	16
Medicine Dropper	A	13
Medicine Glass	A	21
Murphy Drip	A	17
Murphy Drip Connectors	D	16
Mucus Traps	A	21
Nebulizer—Glass	G	5
Pumps—Sterile, Breast	I	15
Slides—Sterile	D	16
Test Tubes	D	16
Instruments		
Anal Speculum	A	13
Clips—Metal, Skin	A	20
Clips—Remover Set	A	21
Cord Clamp—Sterile	I	14
Director—Groove	B	20

(1) Orthopedic Room.

Sample of Index to Supplies and Equipment—Continued

Items	Section	Shelf
Instruments—Continued		
Forceps—Addison	A	12
Forceps—Allis	A	20
Forceps—Large Curved Ring	A	13
Forceps—Thumb	A	21
Forceps—Tissue	A	20
Forceps—Splinter	A	20
Forceps—Uterine	A	13
Hemostat—Small	A	13 and 21
Hemostat—Medium	A	13 and 21
Mosquito—Curved	A	21
Mosquito—Straight	A	21
Needle Holder	A	13
Probes	A	13
Scalpel	A	20
Scissors—Curved	A	13
Scissors—Metzenbaum	A	13
Scissors—Suture	A	21
Sponge Forceps	B	12
Sterile Linen		
Emergency Sheets	A	3
Gowns (Doctors')	A	3
Gowns (Patients')	E	33
Hand Towels	A	3
Packs (Delivery)	M	2 to 10
Packs (Surgical)—Minor	N	1 to 10
Packs (Surgical)—Major	O	1 to 10
Packs (Surgical)—Special	P	1 to 10
Pillow Cases	E	34
Sheets, Draw	E	34
Sheets, Bed	E	34
Sheets (Delivery)	M	1 to 11
Sheets (Surgical)	R	1 to 10
Towels (Surgical)	D	1 to 10
Wash Cloths	E	33
Orthopedic Linen		
Child's Traction Linen	H	1–2–3
Circular Frame Linen	H	4–5–6
Portable Suspension Traction Frame Linen.	H	7
Turning Frame Linen	H	8–9–10
Miscellaneous		
Arm Boards	F	5
Air Cushion	G	2
Air Ways	E	26
Bags—Drainage, Plastic	A	22
Bag—Enema	A	6
Bags—Flatus	A	7

Items	Section	Shelf
Miscellaneous—Continued		
Bags—Ice Collar	I	7
Bands—Rubber	L	23
Bed-Pan Covers	L	32
Blocks—Shock	(1)	(1)
Boards—Arm	F	5
Boards—Foot	(1)	(1)
Brushes—Hand, Sterile	A	3
Cervical Scraper	L	13
Compressor Screw (IV Clamp)	F	1
Convalescent Ring	G	13–14
Cord Tie, 16 inches	C	3
Cots—Finger	D	4
Cup—Sputum	F	2
Cushion Ring (Rubber)	G	13–14
Denture Cups	L	36
Drain-Bag—Plastic	A	22
Enema Soap	A	7
Eye Shield—Metal	A	21
Funnels—Sterile	A	6
Gloves—Disposable	F	7
Gloves—Sterile	D	22–23–24
Gloves—Version	J	1
Ice Caps	G	7
Lubricant	A	7
Pins—Safety, Sterile	D	16
Razors	I	7
Strainer—Fish Net (for Kidney Stones)	F	11
Vaseline—Sterile	C	6
Needles and Syringes		
Disposable needles:		
21g x 1½ inches	D	14
22g x 1½ inches	D	14
23g x 1 inch	D	14
25g x ⅝ inch	D	14
19g x 1½ inches	D	14
Disposable syringes:		
2½ cc	D	14
6 cc	D	14
10 cc	D	14
20 cc	D	14
Insulin, 40-80 Units	D	11
Irrigating	A	5
Toomey	D	6
Tuberculin	D	11
Glass syringes:		
Asepto	A	4
Insulin, 40-80 Units	D	11
Regular 5, 10, 20, 30, 50 cc	D	14
Toomey	D	0
Tuberculin	D	11

[1] Orthopedic Room.

Sample of Index to Supplies and Equipment—Continued

Items	Section	Shelf
Needles and Syringes—Con.		
Needle and syringe combination:		
2 cc. with 19g x 1½ inch needle	D	13–L–3
2 cc. with 21g x 1½ inch needle	D	13–L–3
2 cc. with 22g x 1½ inch needle	D	13–L–3
2 cc. with 23g x 1 inch needle	D	13–L–4
2 cc. with 25g x ⅝ inch needle	D	13–L–4
Reusable needles:		
Hypodermic—All sizes	D	14
Special	C	5
Cardiac	C	5
Spinal	C	5
Titus cut-down	C	5
Sterile Trays and Sets		
Special trays:		
Aortogram Tray	B	1
Arteriogram Tray (angiogram)	B	2
Aspirating Set (joint aspirating)	A	16
Bladder Irrigation Set (intermittent or tidal drainage).	A	18
Bone Marrow Tray (sternal puncture).	B	10
Bronchogram Tray	B	3
Cardiac Arrest Tray	B	6
Catheterization Tray	A	23
Circumcision Set	A	12
Colostomy Irrigation Set	A	8
Cut Down Tray (venesection)	B	7
Douche Set	A	19
Dressing Tray	D	1
Emergency Delivery Set	M	1
Enema Set	A	7
Eye Dressing Tray	A	21
Gastric Feeding Set	F	13
Gastric Set (analysis or lavage)	F	15

Items	Section	Shelf
Sterile Trays and Sets—Con.		
Special trays—Continued		
Gynecology Tray (cytologic)	A	22
Irrigation Set	A	6–7
Liver Biopsy Tray (kidney)	B	4
Myelogram Tray	B	3
Nasal Hemorrhage Tray	B	7
Para-Thoracentesis Tray (amniocentesis).	B	0
Peritoneal Dialysis Tray	B	6
Proctoscopy or Sigmoidoscopy Set.	B	4
Salpingogram Tray	B	1
Spinal Tray (lumbar puncture)	B	0
Subdural Tray	B	11
Suture Tray (muscle biopsy, incision and drainage).	A	4
Throat Irrigation Set	A	17
Tonsil Hemorrhage Tray	B	12
Tracheotomy Tray (tracheostomy).	B	13
Vaginal Examination Tray	A	21
Venous Pressure Tray	B	10
Water Seal Drainage Set (closed chest drainage).	A	22
Sterile Utensils		
Basin—Wash	W	2
Basin—Large, Round	J	5
Basin—Emesis	W	1
Basin—Small, Round	J	6
Cup—Solution	J	3
Forceps and Holder	A	12
Graduates (500 cc.)	A	10
Graduates (1,000 cc.)	A	12
Pans—Bed	W	5–6
Pans—Fracture	W	4
Urinals	W	3

Equipment Storage Room

Items	Section	Shelf
Portable Equipment		
Alternating Pressure Mattress	H	0–7–14–15
Aquamatic Motor	H	4
Aquamatic Pads	H	5
Aspirator—Gastric	A	
Aspirator—Oral	A	
Barron Pump	H	3
Cradle Bed	B	
Electric Room Deodorizer	I	16
Heat Cradle	B	
Heating Pad—Electric	G	14
Lamp—Perineal	B	

Items	Section	Shelf
Orthopedic Supplies		
Adjustable Crutches	F	
Bed Boards	I	
Bed Cradle	I	
Bed Lifter	L	
Belts—Pelvic, Traction	C	3–4
Bradford Frames	K	
Bryant's Traction	K	
Buck's Extension Apparatus	D	4
Buck's Extension Bracket	D	4
Buck's Extension Hooks	D	4
Blocks—Shock	E	1–2–3–4–5

Equipment Storage Room—Continued

Items	Section	Shelf
Orthopedic Supplies—Con.		
Canes	F	1
Carriers—Weight	C	5
Chair Walker	F	
Clamps—Plain, Small	D	6
Clamps—Plain, Large	D	6–7
Clamps—Pulleys	D	6
Cradle Foot	I	
Crutches	F	
Foot Boxes	E	6
Head Halter—Disposable	C	2
Head Halter—Regular	C	1
Head Halter Spreader Bar	C	2
Overhead Frames	K	5
Overhead Octagon Frames	K	
Overhead Patient Helpers	K	
Pelvic Sling	C	7
Pelvic Sling Framework	C	8
Pelvic Traction Spreader	C	0
Rope	B	5
Sand Bags	G	5
Sheets—Wadding	D	2
Splint—Airplane	J	2
Splint—Clavicular	J	2
Splint—Thomas, Arm	J	
Splint—Thomas, Leg	J	
Circular Frame	L	
Circular Frame Accessories	M	3
Portable Suspension Traction Frame.	L	
Turning Frame	L	
Trapeze	C	4
Walker	F	
Weights Nos. 1–2–5 and Water Weights.	C	5

Parenteral Solutions and Administration Sets

Symbol	Solutions	Amount	Section	Shelf
5–D–5–W	Alcohol 5 percent—Dextrose 5 percent in Water	1,000 cc	E	7
	Amigen 5 percent—Dextrose 5 percent	1,000 cc	E	18
	Amigen 5 percent—Levulose 10 percent	1,000 cc	E	18
–2½–½S	Dextrose 2½ percent in Half Normal Saline	250 cc	E	13
–5–½S	Dextrose 5 percent in Half Normal Saline	500–1000 cc	E	11–12
–5–0.2 percent S	Dextrose 5 percent in 0.2 Saline	500 cc	E	11
–2½–S	Dextrose 2½ percent in Saline	250–500 cc	E	13
–5–S	Dextrose 5 percent in Saline	250–500–1,000 cc	E	12–14
–10–S	Dextrose 10 percent in Saline	500–1,000 cc	E	10
–2½–W	Dextrose 2½ percent in Water	250 cc	E	6
–5–W	Dextrose 5 percent in Water	250–500–1,000 cc	E	3–4–5
–10–W	Dextrose 10 percent in Water	500–1,000 cc	E	2
–W	Distilled Water	1,000 cc	E	26
–W	Distilled Water	30 cc	E	6
–10–S	Invert Sugar 10 percent in Saline	1,000 cc	E	0
–5–W	Invert Sugar 5 percent in Water	1,000 cc	E	1
–10–W	Invert Sugar 10 percent in Water	1,000 cc	E	1
–10–S	Levulose 10 percent in Saline	1,000 cc	E	1
–10–W	Levulose 10 percent in Water	1,000 cc	E	2
–S–S	Normal Saline	30 cc	E	14
–S–S	Normal Saline	250–500–1,000 cc	E	23

Symbol	Administration Sets	Amount	Section	Shelf
	Blood and Plasma Infusion (Adult)		E	16
	Blood and Plasma Infusion (Pediatric)		E	25
	Blood and Plasma Infusion (Pump)		E	16
	Connection		E	15
	Extension		E	25
	Hypodermoclysis		E	24
	Infusion (Pediatrics)		E	25
	Intravenous		E	15
	Scalp Vein Sets (Pediatrics)		E	24

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U.S. GOVERNMENT PRINTING OFFICE: 1966 O—208–750